

New York State Museum

FREDERICK J. H. MERRILL Director

Bulletin 62

MISCELLANEOUS 1

NATURAL HISTORY MUSEUMS

OF THE

UNITED STATES AND CANADA

BY

FREDERICK J. H. MERRILL

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Bulletin 62

MISCELLANEOUS 1

NATURAL HISTORY MUSEUMS OF THE UNITED STATES AND CANADA

PREFACE

The lack of general and specific information concerning the natural history museums of this country and their collections has made it seem important to collate for publication all facts concerning these educational mediums which could be obtained directly or otherwise.

With this aim, circular letters have been sent to all institutions where collections or museums exist, asking for full details. From the replies received, the following directory has been compiled and while many errors and omissions may be found in this first edition, the aid of museum curators and administrative officers throughout the country is solicited, in the attempt to make the publication accurate and reliable.

To my assistants Mr J. N. Nevius and H. H. Hindshaw, who have greatly aided me in the compilation, I desire to express my obligations.

FREDERICK J. H. MERRILL

Albany, July 1902

UNITED STATES

ALABAMA

Alabama polytechnic institute museum, Auburn. P. H. Mell, *director state experiment station* in charge; G. F. Boyd, *assistant*. The fire that destroyed the main building in 1887, swept away the museum which contained a very full representation of all branches of science and was one of the best in the south.

Paleontology. Several hundred specimens representing several formations including the Claiborne of this state; a small collection of fossils from the Paris basin representing to some extent the different formations.

Mineralogy. 600 specimens.

Historic and economic geology and lithology. 100 specimens.

Zoology. 75 specimens, a few representing the local fauna.

Botany. 40,134 specimens: 16,950 fungi; 1006 lichens; 588 algae; 20,606 flowering plants.

Ethnology and anthropology. A few specimens.

Geological survey of Alabama, University. Eugene A. Smith, *state geologist*; Henry McCalley, *assistant*.

Geology and paleontology. About 75,000 specimens comprising about 15,000 catalogue titles: three fourths illustrative of Alabama geology, and the remainder of a general nature.

Mineralogy. 4800 specimens.

Zoology. 8100 specimens: 900 skins of Alabama birds; 200 fishes and other marine forms; and 7000 recent shells.

Botany. 4300 Alabama plants, flowering plants and cryptogams about equally represented: 1000 foreign plants mostly cryptogams.

Ethnology. 435 relics of North American Indians.

Total. 26,000 entry titles, and 94,000 specimens.

Howard college, East Lake. No report.

Southern university, Greensboro.

Small general collection.

ARIZONA

University of Arizona, Territorial museum, Tucson. Herbert Brown and professors in various departments, *curators*.

Paleontology. Collections of Arizona fossils, Devonian corals, etc. Horn cores of *Bos arizonica*.

Mineralogy. 2500 specimens: a series illustrative of the physical properties of minerals, showing color, luster, hardness, etc.; miscellaneous specimens, principally ores of the useful metals, from Arizona localities; a series of copper minerals from the Copper Queen mine at Bisbee; some foreign material, and the 86 pound Weaver meteorite.

Economic geology. Copper ores from Bisbee, ores and metallurgic specimens from the gold, silver and lead mines of the territory; gypsum clays, cement, and a partial series of building stones.

Lithology. 3000 specimens: illustrating the rock formations of the territory; collection of typical rock species purchased from Krantz of Bonn, and a suite from the United States geological survey.

Zoology. 1500 specimens: a miscellaneous representation of mammals, birds and reptiles, mostly from Arizona, including the Brown collection of 1200 skins of Arizona birds.

Botany. 10,000 specimens, United States and Mexican plants. 2500 specimens in the botanical survey herbarium illustrating the Arizona flora. A special feature of the herbarium is its completeness in the order Cactaceae represented by more than 1000 mounted specimens and as many more unmounted duplicates.

Ethnology and archeology. Specimens of ancient and modern aboriginal pottery from the pueblos and cliff houses of Arizona. Stone implements. Historic relics of the Spanish conquest. Skulls, clay images. Suites of figures illustrating the dress of the Yuma Indians and Mexicans.

ARKANSAS

Hendrix college museum, Conway. G. L. Harrell, *director*.

Mineralogy. 800 specimens arranged in economic groups and including gold, silver, lead, zinc, iron, copper, antimony, calcium barium and silicon. Specimens include native gold, native silver

and galena from Colorado; sphalerite, smithsonite, pyrite, malachite and stibnite from Arkansas; antimony and calcite from England, Bohemia and Mexico; smithsonite from Greece; stibnite from Utah.

Historic and economic geology and lithology. 72 specimens: representative of the Carboniferous, Subcarboniferous, Niagara and Trenton.

Zoology. 100 specimens: serpents, insects and mollusks.

University of Arkansas museum, Fayetteville. A. H. Purdue, professor of geology.

Paleontology. 1800 specimens: 300 vertebrates; 1000 invertebrates and 500 plants.

Mineralogy. 2000 specimens: 200 mineral species, mostly oxids, sulfids and silicates.

Economic geology. 50 specimens of building stones; 200 specimens representing the carbonates, sulfids, oxids and silicates.

Petrography. 300 specimens.

Historic geology. 13 relief maps.

Zoology. 2900 specimens: 80 species of mammals and birds (200 specimens); 40 species of reptiles and amphibians (200 specimens) and 18 skeletons; 350 species of fish (1500 specimens); 200 species of insects and other invertebrates (1000 specimens).

Botany. 3500 specimens, illustrating 1500 species.

CALIFORNIA

California academy of sciences, San Francisco. See Addenda, p. 221.

Golden Gate Park museum, San Francisco. C. P. Wilcomb, curator.

Collections are small as this museum is only six years old. It consists of 25 distinct departments and is in a well equipped building.

Paleontology. 2000 specimens and 250 species of fossils.

Mineralogy. 2322 specimens.

Zoology. 24,000 specimens: mammals, birds, fishes and miscellaneous objects of natural history.

Botany. 404 specimens in forestry.

Ethnology. 3416 specimens.

Leland Stanford Junior museum, Stanford University. Harry C. Peterson, *curator*; Edwin A. Austin, *assistant curator*; Daniel V. Noland, *assistant graphic arts*; George M. Shindo, *assistant Japanese dep't*; T. Shibata, George Slade, Robert Godwin, Adelin Martin, *museum assistants*.

Mineralogy. Principally Pacific coast specimens, also collection of Ural mountain ores.

Zoology. A representative collection of birds, birds eggs, seals, etc.

Ethnology. Series of Di Cesnola's material from Cyprus; Indian remains and fabrics, Alaskan material, very complete collection of stone age specimens from Denmark; a comprehensive collection of Chinese, Japanese and Korean material, also Egyptian, Assyrian, Sudanese and Bisharin collections.

Archæology. Large collections of fine arts, nearly all the gift of Mrs Stanford.

Leland Stanford Junior university, Stanford University. Museum staff: Charles H. Gilbert, *professor of zoology*, in charge of museum; Edwin C. Starks, *curator*; Michitaro Lindo, *assistant*.

Paleontology. Californian Carboniferous, Californian Triassic, Californian Cretaceous, Californian Tertiary and marine Pleistocene, each with large quantity of undescribed material. Not yet listed, but specially full for Triassic, Tertiary and Pleistocene. Chiefly invertebrates. Yates collection of invertebrates and the Law collection of Mollusca are deposited with the department of geology and used constantly in instruction.

Specimens of Carboniferous, Cretaceous, Tertiary and Pleistocene (all invertebrates) of California for exchange.

Mineralogy. Collection illustrating the minerals of the crystalline rocks of New England; local set illustrating the rock-forming minerals of California.

Historic and economic geology. Zinc and lead ores of Missouri; building stones and clays of Arkansas; U. S. geological survey, Eureka, Nevada set; gold and silver ores, manganese ores of Brazil, Arkansas and Georgia; phosphate rocks of the United States.

Lithology. Set illustrating the types of igneous rocks of California, specially complete in granitic rocks. Igneous rocks of Arkansas; igneous and metamorphic rocks of Brazil, Wisconsin and Michigan. Set illustrating the metamorphic rocks of California; a set illustrating the geology of the Lake Superior region. U. S. geological survey educational set of rocks. Collections of crystalline rocks from various parts of the west. Some specimens of the crystalline rocks of California for exchange.

Zoology. Collections consist of 15,346 jars of fishes entered besides large collections of Japanese, Hawaiian and Philippine collections not entered; 1100 jars of batrachians; 5000 jars of reptiles; 5317 bird skins; 2400 mammal skins; 250 fish skeletons. Invertebrate collections not entered. In entomology, 260 trays of mounted insects, a cabinet of alcoholic specimens, about 5000 microscope slides illustrating development and variation, special collections from Japan, Galapagos and Samoan islands, a large collection of Coccidae and the most important existing collection of Mallophaga. Specimens of vertebrates and invertebrates for exchange.

Botany. Mounted sheets chiefly Pacific North American plants; unmounted specimens of all observed spermatophytes on Santa Cruz Mt peninsula. Deposited by professor of botany, 1) collection of California plants chiefly from Inland, Nevada and Monterey counties; 2) collection of plants of central New York—spermatophytes to fungi; 3) collection of marine algae from Woods Hole. Some specimens of California spermatophytes for exchange.

San Diego society of natural history, San Diego. Daniel Cleveland, *president*.

Small collections of geologic material.

Santa Clara college museum, Santa Clara. A. Cichi in charge.

Paleontology. 1000 specimens: Ward's college collection; a good collection of corals and some of Von Zittel's charts.

Mineralogy and geology. 2300 specimens: 250 specimens from France; 1020 specimens from Germany, and over 1000 specimens of ores from California and Nevada mines.

Zoology. Collection of skulls of different classes of mammals; 120 alcoholic specimens of invertebrates from Lenoir & Forster, Vienna; 101 Leuchardt charts; 100 Gerold's charts.

Botany. 1500 specimens of plants and a fine collection of Brondel's models in hardened gelatin, illustrating specially the fertilization of cryptogams, mosses, molds, bacteria, etc.

Ethnology and anthropology. A collection of skulls of the different races of men.

The museum also contains a collection of relief maps.

State mining bureau, San Francisco. L. E. Aubury, *state mineralogist*; J. M. Cline, *curator*.

15,750 specimens: ores, minerals, rocks, etc., principally from California and the Pacific coast, but to a small extent representing the whole world.

One side of the museum is devoted to California. Collections are arranged by counties and districts; and there are 32 cases of gold quartz, five of silver ores, five of copper, four of quicksilver, one of iron, one of chrome iron ore, and two of the ores of manganese, antimony, lead, zinc, etc. Marbles and building stones of the state are also represented.

On the opposite side of the museum are 34 cases of crystallized minerals, largely from California, but also foreign. These are arranged mineralogically: two cases of iron, two of copper, one of manganese ores, etc.

There is also a series of economic minerals, such as borax, niter, sulfur, alum, crude and refined oils, asphalt, coals, clays, gypsum, etc., chiefly from California, arranged to show the state resources.

The vestibule is largely devoted to paleontology, and contains some ethnologic and historic specimens.

There are also many models of mining machinery and mine timbering, photographs and maps.

University of California, Berkeley. J. C. Merriam *professor of paleontology*; A. C. Lawson *professor of mineralogy and geology*; W. E. Ritter *professor of zoology*; William Albert Setchell *professor of botany*; A. L. Kroeber *professor of ethnology and archeology*.

The heads of the various departments are in charge of the collections.

Paleontology. Collections made by the California geological survey: type or representative specimens of all known California fossils; splendidly preserved fossils illustrating the paleontology of the state; a large series illustrating the development of invertebrate life in North America and a carefully selected series of crinoids from Crawfordsville Ind.

Mineralogy. A very large systematic collection and a series of glass and wooden crystal models.

Economic geology. Sets of specimens from mines on the Pacific coast: gold, silver, mercury, iron, copper and coal, showing for each mine the ores, veinstones, wall rock, and other important features.

Structural geology. Fine models of the more interesting geologic regions, chiefly in the United States containing an excellent relief map of the peninsula of San Francisco from $37^{\circ} 30'$ to the Golden Gate, on a scale of 2 inches to the mile.

Lithology. Many hundred rock specimens from the eastern states and territories, England and the European continent, and a large number of California rocks collected by the state geological survey; also 3600 slides for microscopic study.

Zoology. Good collections of both invertebrates and vertebrates. The collections of marine invertebrates from the Pacific coast, specially of the groups Coelenterata, Crustacea, Echinodermata, Annelida, Bryozoa, and Tunicata, are rich and are being rapidly increased. There is a large type collection of California molluscan shells, and besides a general collection in the same group of 2300 specimens. In entomology the agricultural department possesses a collection of over 2000 determined species of beetles. There is also a large collection of Lepidoptera. The collections of amphibians, reptiles, birds and mammals are fairly representative of the California fauna in these groups. The collection of Alaska birds and mammals is good. The collection of vertebrate skeletons has been greatly enriched recently through a gift of about 50 new types. These were

selected with the view of supplementing the forms already possessed; and the collection of types is now complete for the purposes of general instruction in comparative anatomy. The large Alaskan collections recently given to the university by the Alaska Commercial Company have been recently transferred to the new ferry building in San Francisco for temporary exhibition, and the natural history specimens are there available for study by students carrying on investigations.

Botany. Some thousands of specimens of California plants, of which over a hundred are new species; a representation of woods, cones and tree photographs; several hundred specimens from the southern part of the state; a herbarium of the United States grasses; an excellent representation of the flora and silva of the southern Atlantic states; 1000 specimens from Oregon, Washington and North Dakota; a fine representation of the Australian flora; several thousand specimens from eastern United States; 4000 specimens of ferns, mosses, hepaticas, marine algae, fungi, etc., and also the algae, fungi and lichens of Prof. Setchell.

Ethnology and archeology. Many stone implements and skeletons obtained from mounds and river gravels of the Pacific coast, some presented by D. O. Mills and many more recently collected by various expeditions sent out by Mrs Phebe A. Hearst; wooden and stone implements, and other articles illustrating the manners and customs of the people of the Pacific islands, presented by F. L. A. Pioche; rich Peruvian collections; Indian utensils, a series of models of the cliff dwellings of New Mexico and Arizona. Recently the Alaska Commercial Company has presented to the university its collection illustrative of the habits of life of the Eskimos of Alaska and the Behring sea. This collection has been in process of accumulation for many years, and is very rich. Extensive collections in Egyptian archeology are being constantly received from investigations carried on in Egypt through the support of Mrs Phebe A. Hearst.

The collections belonging to the university were obtained from several sources. 1) The state geological survey contributed the

extensive collection of minerals, fossils, marine and land shells, and skins of California birds which were the type specimens of the species described in its ornithologic report; a set of Ward casts of selected types of the larger fossils was added later. 2) The Pioche collection of South American shells, fossils, minerals and ores illustrative of Pacific coast forms. 3) California land shells and native ores and rocks from D. O. Mills. 4) A costly mineral collection of James R. Keene. 5) The expeditions of the various natural history departments. Type specimens of new species and specimens illustrating various facts in the natural history of California's marine fauna are placed in the museum. 6) The extensive collections in Alaskan ethnology and natural history from the Alaska Commercial Company. 7) The explorations in Egypt, Greece, Peru and California conducted at the expense of Mrs Phebe A. Hearst.

University of southern California, University station, Los Angeles. Albert B. Ulrey, *professor of biology*.

Paleontology. 2950 specimens which are now being arranged for exhibition. Material for exchange.

Mineralogy. 3700 specimens. Material for exchange.

Historic and economic geology and lithology. 1000 specimens.

Zoology. 22,300 specimens: 525 birds and 125 birds eggs, 350 other vertebrates including a fairly large series of fishes and Kansas snakes; series of corals and other marine invertebrates; a small collection of insects, and 19,500 mollusks. A complete collection of vertebrates from the island of Santa Catalina is being made.

Botany. 5000 specimens; collectors are now at work in the interest of this department. Material for exchange.

Ethnology. 730 specimens. Material for exchange.

COLORADO

Bureau of mines of the state of Colorado, capitol, Denver. Harry A. Lee, *commissioner*.

The collections are all of an economic and mineralogic nature including a complete collection of the minerals and ores of the

state of Colorado, arranged by counties; a series of its coal, coke and iron products; samples of the massive ores of the various mines in the state and the Dr Ellsner collection of minerals from all parts of the world.

Colorado college and Cutler academy, Colorado Springs. No report.

Colorado scientific society, Boston building, Denver.

Classified collection of minerals, rocks and fossils on exhibition daily except Sunday.

Colorado school of mines, Golden. H. B. Patton, *professor of geology and mineralogy*, in charge.

Paleontology. A display collection mainly of fossils, 342 specimens and a miscellaneous collection of 1360 specimens.

Mineralogy. A display collection of Colorado minerals, 1305 specimens; a type collection, 3700 specimens; a supplementary collection of the rarer species, 950 specimens; a working collection of 21,000 specimens; and a crystallographic collection of 950 specimens; the R. C. Hills collection of minerals, a collection of the coals of Colorado, Wyoming and New Mexico, 800 hand specimens and slides of Colorado and New Mexico eruptive rocks. Prof. Patton's private collection of 970 specimens is displayed.

Historic and economic geology and lithology. A type collection of rocks consisting of a) a general collection b) a series of Colorado rocks, 1800 specimens; a working collection of 17,400 specimens and the U. S. geological survey educational series of rocks, 156 specimens. Prof. Patton's private collection of 1700 lithologic specimens is also exhibited.

The museum has many specimens to exchange.

Mining and metallurgy. Excellent set of models of furnaces, mills, crushers, with models of mines, examples of timbering, etc.

State agricultural college, Fort Collins.

The collections are in charge of the heads of the several departments: W. P. Headden, *paleontology and mineralogy*; Wendell

Paddock, *botany and horticulture*; and Clarence P. Gillette, *zoology*, in charge.

Paleontology. About 550 choice specimens.

Mineralogy. 400 typical specimens.

Lithology. 1672 hand specimens of rocks.

Economic geology. 1000 specimens of ores.

Zoology. 60,000 specimens, including 55,000 insects exhibited in good form for study. Also 13 mounted skeletons of vertebrates; a number of skulls; 75 mounted mammals, 300 mounted birds; 60 bird skins and 700 birds eggs; a mounted collection, 300 specimens, of sponges, corals, mollusks and crustaceans. Also an economic collection of 200 specimens of plants injured by insects, and 200 honey-bearing plants; a series of wax models illustrating the segmentation of the egg and the development of the chick; and models of several parts of the human body, including the eye, ear, throat and larynx. A large number of Colorado insects are for exchange.

Botany. 7000 specimens: 1000 species of Colorado phanerogams and 2500 from other states; 300 species of Colorado fungi and 2000 from other states. 4000 specimens for exchange.

Ethnology. Small collection.

University of Colorado museum, Boulder. Nevin M. Fenneman, *professor of geology*, and Francis Ramaley, *professor of biology*, are in charge of the collections.

Paleontology. 500 partly labeled specimens.

Mineralogy. 700 exhibition specimens, a study set of about 400 mineral specimens, and 75 microscope slides of minerals. In the economic collections is a set of 600 specimens of characteristic ores of Colorado particularly rich in tellurids.

Lithology. 400 specimens of typical rocks; 140 specimens of typical rocks of Cripple creek region (the G. H. Stone collection); the United States geological survey educational series of rocks; 75 specimens illustrating geologic structure; and 360 microscopic slides of typical rocks.

Zoology. 600 specimens: a series of vertebrate skeletons; a set of North American fishes, from the Smithsonian institution;

a fairly complete set of invertebrates, both alcoholic and dry specimens; besides 1000 microscope slides in zoology, embryology and histology. This material is reserved for class use almost exclusively, and to give thorough training in laboratory work.

Botany. 4000 herbarium specimens: a large amount of alcoholic material, representing all groups of plants, for laboratory use; many West Indian, west American and Mediterranean algae; a good selection of microscope slides, specially of rare material in anatomy and cytology.

University of Denver, Denver.

No report.

CONNECTICUT

Connecticut agricultural college, Storrs. Rufus W. Stimson in charge.

Paleontology. 500 specimens.

Mineralogy. 700 specimens.

Historic and economic geology and lithology. 900 specimens.

Zoology. 10,000 specimens: representing nearly every group of the animal kingdom. 50 to 75 species of marine invertebrates to exchange for Devonian and other fossils.

Botany. 1500 specimens: general flora of Connecticut.

Ethnology. 75 specimens: Indian implements.

Peabody museum of natural history, Yale university, New Haven. Charles E. Beecher, *curator in geology and paleontology*; Addison E. Verrill, *zoology*; Edward S. Dana, *mineralogy*; George F. Eaton, *osteology*.

Paleontology. The very extensive invertebrate collections are arranged zoologically. There are some fine, large slabs containing fossils, on exhibition; also type collections showing the development, structure and classification of trilobites and brachiopods.

The vertebrate possessions include many of the finest specimens ever collected: collections made by Prof. Marsh, of vertebrate fossils from the Rocky mountain region and other parts of the west; specimens of toothed birds, mainly *Hesperornis* and

Ichthyornis, discovered by Prof. Marsh in the Cretaceous rocks of Kansas; specimens of the Miocene Brontotheridae from Dakota and Nebraska; remains of Dinocerata from the Eocene of Wyoming; two skeletons of the gigantic moa from New Zealand; a mounted skeleton of a large Cretaceous dinosaur, *Clasaurus*; remains of *Atlantosaurus*, the largest of known land animals; the mounted pelvis and hind limbs of *Brontosaurus*, and a skull of *Triceratops* from the Cretaceous of Wyoming.

Mineralogy. The Gibbs collection, deposited by Col. George Gibbs; private cabinet of Prof. Brush, for study and investigation only and not for general exhibition; one of the largest collections of meteorites in the country, containing the famous mass of meteoric iron weighing 1635 pounds from Texas, some hundreds of large and small meteorites from a single fall in Iowa in May 1879, the interesting Weston meteorite which fell in Weston in 1807, and nearly 1000 meteorites from the great meteoric fall of May 2, 1890, in Winnebago county, Ia.; the large and beautiful collection of Chinese artistic work in stone, chiefly in jade and agates, bequeathed by Dr S. Wells Williams.

Historic and economic geology. Collections in laboratories for use of students.

Zoology. One of the most complete collections of corals in the country; a collection of marine invertebrates from New England; shells and corals from the Pacific coast of America, corals of Bermuda, and shells of Florida, etc.; models of two of the huge cephalopods of the world, one an octopus and the other a species from the Newfoundland seas, related to the squids; skeletons deposited by Prof. Marsh and a nearly complete series of the vertebrate species of New England are on exhibition.

Archeology and ethnology. Collections occupy the fourth floor of the museum.

Scientific association of Meriden, Meriden. Charles H. Stanley Davis, *corresponding secretary*; Willis J. Prouty, *curator*.

Collections not extensive. The late Prof. J. H. Chapin, of St Lawrence university, presented his collection of 2000 minerals to the association.

Geology. 1200 specimens, a portion of which are in the high school.

Trinity college museum, Hartford. Charles Lincoln Edwards in charge; Karl Wilhelm Genthe, *instructor in natural history*.

Paleontology. Typical fossils, originals and casts; among the latter are Ichthyosaurus, Plesiosaurus, Mastodon, Dinotherium, Glyptodon, Megatherium and about 60 Ammonites.

Mineralogy. Type minerals, specially from New York and New England, also many European specimens.

Historic and economic geology and lithology. Models and photographs of volcanic and other important mountains; collections illustrating Vesuvian minerals and rocks and the Triassic formations of Connecticut; Ward collection illustrating the New York system of rocks; Ward stratigraphic collection, and Ward systematic collection of rocks (college series).

Zoology. Skeletons of mammals, birds nests and eggs, shells and corals; Blaschka glass models of Hydrozoa; Ziegler's wax models showing development of the frog and chick.

Botany. Herbarium of Nebraska plants.

Ethnology and anthropology. War clubs, arrowheads, pipes, dresses, pottery, etc., and material, including a skeleton, from the Santa Catalina islands.

Wesleyan university, Middletown. B. P. Raymond, *president*, in charge, assisted by W. N. Rice, *professor of geology*, H. W. Conn, *professor of biology*, and S. W. Loper, *curator*.

Paleontology. 15,000 specimens: including Lower Silurian fossils from Cañon City, Colorado, and Valcour island, Lake Champlain; Subcarboniferous fossils from Chattanooga Tenn., and Crawfordsville Ind.; a fine representation of Triassic fishes, and some fossil footprints of dinosaurs, etc. from the shales and sandstones of the Connecticut valley; lithographic limestone fossils from Solenhofen; a fine representation of Tertiary plants, insects, and fishes from Fossil Wy. and Florissant Col.; many casts of fossils made by Ward and others.

Duplicates of Triassic fishes from the Connecticut valley, and fossils from Cañon City Col. and Fossil Wy. for exchange.

Mineralogy. 13,000 specimens: fine material from both American and European localities; rich in minerals from Middletown, Portland, Haddam, and Chatham Ct.

Duplicates of Connecticut minerals for exchange, specially those from vicinity of Middletown.

Lithology. Collections general, with special exhibits of New Hampshire rocks and of the United States geological survey educational series.

Dynamic geology. Characteristic specimens showing the work of atmospheric, aqueous, organic and igneous agencies.

Zoology. 110,000 specimens: vertebrates of the United States; birds of the United States, marine invertebrates of the Atlantic coast; a large collection of molluscan shells, obtained chiefly by the purchase of the collection of Simeon Shurtleff M. D.; smaller collections of South American birds and Australian mammals. Duplicate shells for exchange.

Botany. 12,000 specimens: herbarium of 5000 species, including some of the collections of Joseph Baratt M. D.; specimens of woods, alcoholic specimens of fungi, etc.

Ethnology. 8000 specimens: relics of the North American Indians; weapons, implements, etc. from the South Sea islands; Chinese objects, most of which were collected by the Rev. M. L. Taft D. D., president of the college at Pekin; 3000 coins, exclusive of duplicates, among which is a large series of Chinese coins, many of which are ancient and rare, presented by Dr Taft.

DELAWARE

Delaware college, Newark. W. H. Bishop, *professor of agriculture and botany*, in charge also of *zoology*; T. R. Wolf, *professor of chemistry, geology and mineralogy*, in charge also of *paleontology*.

Collections general in character.

Paleontology. 250 specimens.

Mineralogy. 600 specimens.

Economic and historic geology. 300 specimens.

Zoology. 200 specimens, mostly invertebrates from the national museum.

Botany. 1000 specimens.

Society of natural history of Delaware, Wilmington. Mrs Ghere-
tein Yeatman, Kennett Square Pa., *corresponding secretary.*

Paleontology. No collection.

Mineralogy. 1500 specimens, part of which are lent to the
society, which, however, owns a fairly representative collection
of Delaware minerals.

No duplicates for exchange; though Fred J. Hilbiber will ex-
change Delaware minerals for the benefit of the society.

Economic geology and lithology. Collections small.

Zoology. 400 specimens of the birds of New Castle county
and a fine collection of Delaware moths and butterflies.

Frank Morton Jones will exchange.

Botany. 50,000 specimens: well made herbarium of about
11,500 species, generally from the United States and northward,
but including forms from Mexico, West Indies and Europe, care-
fully prepared and arranged for use of students; a local her-
barium called the "Edward Tatnall herbarium of New Castle
county"; collection of diatoms, made by the late Christian
Febiger.

No exchange material; but William M. Canby, Edward Tatnall,
and J. T. Pennypacker will exchange for the benefit of the
society.

Ethnology. Collections small.

State college for colored students, Dover. W. C. Jason, *president.*
Collections small.

DISTRICT OF COLUMBIA

Catholic university of America, Washington. Edward L. Greene,
professor of botany.

Botany. Between 30,000 and 40,000 specimens: the most
complete collection extant of Rocky mountain and Pacific
coast vegetation, gathered by Prof. Greene during 25 years of
residence and travel, containing types of some hundreds of new
species described by him since 1880; a nearly complete herbarium

of eastern and southern botany, with much material from Mexico, South America and Europe.

Duplicates of eastern and far western plants for exchange.

Columbian university, Washington. Howard L. Hodgkins, *dean*.

Small collections for teaching purposes and laboratory use.

Geology, ornithology, botany. Working collections.

Georgetown university, Coleman museum, Georgetown. George A. Fargis in charge.

Paleontology. 1500 specimens: invertebrates of the Upper and Lower Silurian and Jurassic formations; Tertiary fossils, specially those from the formations along the Potomac and Chesapeake rivers, and several fine specimens of tusks of the mammoth from Alaska.

Mineralogy. 4000 specimens: minerals from Mt Vesuvius; series of silicates; also a very complete separate collection of minerals from the District of Columbia.

Historic geology. 1100 specimens: a complete and carefully selected representation of rocks of all geologic periods.

Zoology. 10,000 specimens: mammals; birds and birds eggs; reptiles; batrachians; a collection of 200 fishes representing 50 different species; insects; crustaceans; mollusks; echinoderms, and a collection of corals and shells from Manila.

Botany. A very complete series of the woods, and representatives of the marine algae, mosses, ferns and phanerogams of the District of Columbia.

Ethnology and archeology. A very complete series of the Indian remains found in and around the District of Columbia; a fine collection of Alaskan curios, illustrating the dress and customs of the natives; a complete series of papal medals from Martin 5 to Leo 13 (1893); a large collection of ancient and modern coins; and some Chinese and Spanish weapons.

Howard university natural history museum, Washington. W. P. Hay, *professor of natural history*.

Paleontology. 500 specimens: mostly hand specimens for class use including Dakota fossil leaves, Paleozoic shells, and a few Tertiary vertebrates and mollusks.

Mineralogy. 800 specimens: best representative of Washington and vicinity; all specimens reserved for class use.

Zoology. 750 specimens: a few mounted birds; a good series of skeletons, many invertebrates in fluid and dry; and 300 microscope slides of Foraminifera, parts of insects, etc.

Botany. 2000 specimens: flora of the District of Columbia; a working collection of exogens; and 200 sections of trees.

Ethnology. A few Indian implements and some war relics.

United States national museum, Washington. Scientific and administrative staff: Samuel P. Langley, *secretary of the Smithsonian institution, keeper ex officio*; Richard Rathbun, *assistant secretary of the Smithsonian institution*, in charge of the United States national museum; W. de C. Ravenel, *administrative assistant*.

Scientific staff

Department of anthropology: W. H. Holmes, *head curator*.

1 Division of ethnology: O. T. Mason, *curator*; Walter Hough, *assistant curator*; J. W. Fewkes, *collaborator*.

2 Division of historic archeology: Paul Haupt, *honorary curator*; Cyrus Adler, *honorary assistant curator*; I. M. Casanowicz, *aid*.

3 Division of prehistoric archeology

4 Division of technology (mechanical phases): J. E. Watkins, *curator*; George C. Maynard, *aid*.

Section of electricity: G. C. Maynard, *custodian*.

5 Division of graphic arts:

Section of photography: T. W. Smillie, *custodian*.

6 Division of medicine: J. M. Flint, *honorary curator*.

7 Division of religions:

Section of historic religious ceremonials: Cyrus Adler, *custodian*.

8 Division of history and biography:

Section of American history: A. H. Clark, *custodian*; Paul Beckwith, *aid*.

Department of biology: Frederick W. True, *head curator*.

1 Division of mammals: Frederick W. True, *acting curator*; G. S. Miller jr, *assistant curator*; Marcus W. Lyon jr, *aid*.

- 2 Division of birds: Robert Ridgway, *curator*; Charles W. Richmond, *assistant curator*; J. H. Riley, *aid*.
Section of birds eggs: William L. Ralph, *honorary curator*.
- 3 Division of reptiles and batrachians: Leonhard Stejneger, *curator*.
- 4 Division of fishes: Tarleton H. Bean, *honorary curator*; Barton A. Bean, *assistant curator*.
- 5 Division of mollusks: William H. Dall, *honorary curator*; C. T. Simpson, Paul Bartsch, *aids*.
- 6 Division of insects: L. O. Howard, *honorary curator*; W. H. Ashmead, *assistant curator*; R. P. Currie, *aid*.
Section of Hymenoptera: W. H. Ashmead, in charge.
Section of Myriapoda: O. F. Cook, *custodian*.
Section of Diptera: D. W. Coquillett, *custodian*.
Section of Coleoptera: E. A. Schwarz, *custodian*.
Section of Lepidoptera: Harrison G. Dyar, *custodian*.
Section of Arachnida: Nathan Banks, *custodian*.
- 7 Division of marine invertebrates: Richard Rathbun, *honorary curator*; J. E. Benedict, *first assistant curator*; M. J. Rathbun, *second assistant curator*; Harriet Richardson, *collaborator*.
Section of helminthologic collections: C. W. Stiles, *custodian*.
- 8 Division of comparative anatomy: Frederick A. Lucas, *curator*.
- 9 Division of plants (national herbarium): Frederick V. Coville, *honorary curator*; J. N. Rose, C. L. Pollard, *assistant curators*; W. R. Maxon, *aid*.
Section of forestry: B. E. Fernow, *honorary curator*.
Section of cryptogamic collections: O. F. Cook, *honorary assistant curator*.
Section of algae: W. T. Swingle, *custodian*.
Section of lower fungi: D. G. Fairchild, *custodian*.
Associates in zoology (*honorary*): Theodore N. Gill, C. Hart Merriam, R. E. C. Sterns.

Department of geology: George P. Merrill, *head curator*.

- 1 Division of physical and chemical geology (systematic and applied): George P. Merrill, *curator*; W. H. Newhall, *aid*.
- 2 Division of mineralogy: F. W. Clarke, *honorary curator*; Wirt Tassin, *assistant curator*; L. T. Chamberlain, *honorary custodian of gems and precious stones*.
- 3 Division of stratigraphic paleontology: Charles D. Walcott, *honorary curator*; Charles Schuchert, *assistant curator*.

Section of vertebrate fossils: F. A. Lucas, *acting curator*.

Section of invertebrate fossils: Paleozoic, Charles Schuchert, *custodian*; Carboniferous, George H. Girty, *custodian*; Mesozoic, T. W. Stanton, *custodian*; Cenozoic, W. H. Dall, *associate curator*.

Section of paleobotany: Lester F. Ward, *associate curator*; A. C. Peale, *aid*; F. H. Knowlton, *custodian of Mesozoic plants*; David White, *custodian of Paleozoic plants*.

Administrative staff

Associate in paleontology (honorary): Charles A. White.

Administrative assistant, William deC. Ravenel; *superintendent* J. E. Watkins; *chief of correspondence and documents*, R. I. Geare; *photographer*, T. W. Smillie; *registrar*, S. C. Brown; *disbursing clerk*, W. W. Karr; *supervisor of construction*, J. S. Goldsmith; *property clerk*, W. A. Knowles (acting); *librarian*, Cyrus Adler; *assistant librarian*, N. P. Scudder; *editor*, Marcus Benjamin.

Paleontology. 376,721 specimens, including much material described in the various government geological surveys; 58,000 types and illustrated specimens; fossil plants from all horizons, invertebrates from the Cambrian, Ordovician, Carboniferous, Upper Cretaceous and Tertiary deposits.

Mineralogy. 29,527 specimens arranged in three general series; exhibition, study and duplicates. The exhibition series, intended for the public and the student, is arranged under the following heads: systematic series; comparative series; meteorite collection; gem collection.

The systematic series is divided into two general classes: native elements and compounds of the elements. The compounds of the elements are further divided and grouped under certain heads according to their more negative constituents, as follows:

Compounds of the halogens, fluorids, chlorids, bromids and iodids. Compounds of sulfur, selenium, tellurium, arsenic, and antimony, including sulfids, selenids and tellurids, arsenids, antimonids, sulfarsenids and sulfantimonids; also sulfosalts. Oxygen compounds, including oxids and the oxygen salts, borates, aluminates, chromites, ferrites, manganites, plumbates, arsenites and antimonites, selenites and tellurites, carbonates, silicates, titanates, columbates and tantalates, nitrates, vanadates, phosphates, arsenates and antimonates, sulfates, selenates and tellurates, chromates, molybdates and tungstates, iodates and uranates. Compounds of organic origin, including salts of organic acids and carbon compounds.

Each of these classes is further separated into groups according to their chemical relationships. Each group is preceded by a general group label stating the class to which it belongs, the group name, a list of the minerals composing that group, together with their chemical formulas, system of crystallization, and a short description of the occurrence, association, and characteristic form of each member of the group. Following the group label, arranged in order from left to right, are the several members of the group selected to illustrate, as completely as the conditions will permit, their occurrences, associations, color, habit, etc.

Each specimen is mounted on a standard block, in front of which is a small label giving the name, locality, etc. of the individual.

In the comparative series the properties of minerals are defined, illustrated and compared. In each case the label containing a definition of the property under consideration precedes a series of specimens and, wherever they can be used advantageously, a series of models illustrating that property.

The meteorite collection, including the Shepard and museum collections, now contains several hundred specimens representing 336 falls. As in the other series, the collections are preceded by introductory labels, on which are noted the more prominent physical and chemical characters of meteorites, together with the classification here adopted. The arrangement of the two collections is somewhat different, that of the museum being geographic, while the Shepard collection is chronologic.

The gem collection now compares favorably with any other public collection of this kind in the country, both in number and kinds of stones exhibited. It is specially rich in those gems and ornamental stones which occur in the United States.

The study series includes material appealing exclusively to the specialist and is the source from which new exhibition series may be built, or old ones strengthened. It contains all that material which has been the source of investigation, or may be made the subject of research; together with those specimens, illustrating the occurrence and associations of a mineral in any one locality, that are not needed in the exhibition series, or which are not unnecessary duplications of the material already on hand. It also contains all original or type material belonging to the department. This is brought together in a case of drawers reserved for that purpose, and all type or original specimens which are not needed to complete the exhibition series are placed here together with a copy or abstract of the original papers, and a bibliography of publication in which the work has appeared. Those types used in the exhibition series are here indicated by cards giving their exact position in the cases.

The duplicate series includes all material not needed for the exhibition or study series, and from it all exchanges, gifts, etc., are made up.

Historic and economic geology and lithology. Four distinct series of specimens: exhibition series, 23,097 specimens; study series, 28,911; microscopic slides, 4700; duplicate series, 77,863 of all kinds.

Zoology. 2,661,148 specimens: mammals 27,016, birds 115,059, birds eggs and nests 64,661, insects 994,236, reptiles and batrachians 38,977, fishes 151,301, marine invertebrates 509,331, mollusks 740,017, helminthologic collection (catalogue entries) 4945, comparative anatomy 15,585.

Many duplicates for exchange.

Botany. 391,241 specimens from all parts of the world. Many duplicates available for exchange.

Anthropology. 818,234 specimens.

The national museum makes exchanges in all departments, and also makes up extensive collections from the duplicate material, specially conchological and geologic, which are presented to educational institutions throughout the country.

FLORIDA

John B. Stetson university, De Land. John F. Forbes, *president*. Collections small, consisting of about 2500 specimens of geologic, mineralogic and zoologic material.

GEORGIA

Bowdon college, Bowdon. No report.

Emory college, Oxford. H. H. Stone, *curator*.

Paleontology. 200 specimens from the Silurian, Carboniferous, Cretaceous and Tertiary.

Mineralogy. 5000 specimens including Smithsonian collections and miscellaneous specimens from Georgia, Maryland, New York, Italy, Sicily and Africa.

Historic and economic geology and lithology. A few specimens.

Zoology. A very limited collection.

The museum is made up largely of Japanese, Chinese and Indian curios together with relics of Civil and Spanish American Wars.

Geological survey of Georgia (state museum), state capitol, Atlanta. W. S. Yeates, *state geologist and curator of the museum*; S. W. McCallie and Thomas L. Watson, *assistant geologists*. Mr McCallie is also assistant curator of the museum in charge of the biologic departments.

Mineralogy. 930 specimens arranged in systematic series.

Economic geology. 149 specimens of Georgia ores, clays, abrasives, etc.; 50 eight inch cubes of building stones including marble, granite, gneiss, hornblende, sandstone, serpentine and Caen stone, from various localities in the state, uniformly dressed to show susceptibility to various methods of finishing. A series of six slabs of marble, white, mottled, pink and gray, from the quarries of the Georgia marble co., at Tate; a pyramid of large lumps of pyrite from Lumpkin county; and a few large specimens of ores of gold, iron and manganese.

Zoology. Collections small.

Botany. 147 specimens of Georgia woods, cut and polished; 236 bottles containing specimens of fruit; an imperfect series of cotton from plant to spindle.

Material exhibited by Georgia at the Cotton states and international exposition, including besides that above mentioned, a relief map of that part of Georgia surveyed by the United States geological survey; 282 specimens of mineral waters; photographic transparencies of Georgia scenery; and 203 Indian relics.

Total, 3352 catalogued specimens.

Mercer university, Macon. J. F. Sellers, *professor of geology*, in charge. G. W. Macon, *professor of biology*.

Paleontology. Willett collection of about 1000 specimens of Mesozoic invertebrate fossils, chiefly Cretaceous; Tolafree collection of about 500 specimens of Paleozoic invertebrate fossils, chiefly Devonian; about 300 specimens of Paleozoic invertebrate fossils, chiefly Silurian; about 200 specimens of Mesozoic vertebrate fossils consisting of fish teeth and vertebrae from the Cretaceous of southwestern and middle Alabama; miscellaneous collection of about 500 invertebrate fossils, Paleozoic, Mesozoic and Tertiary. Total number of specimens 2500. This museum has for exchange about 250 invertebrate Cretaceous fossils.

Mineralogy. Mercer collection of about 1000 rocks, chiefly from United States; Shepard collection of about 1200 minerals from various localities; J. Lawrence Smith collection of about

500 minerals and rocks from various localities; Smithsonian collection of about 1000 minerals and rocks from various localities; Georgia collection of about 500 minerals and rocks from Georgia; miscellaneous collection of about 1000 minerals and rocks chiefly from Georgia. Total number of specimens about 5000. The museum has for exchange about 500 specimens of Georgia minerals and rocks.

Historic and economic geology and lithology. About 1000 specimens of Georgia iron, gold, graphite, asbestos, ochre and bauxite ores; building stones, kaolin, etc.

Zoology. Numerous vertebrate skeletons and parts; a few vertebrate embryos; 50 specimens of Amphioxus, fishes, snakes, turtles and lizards; about 200 specimens of invertebrates; about 100 microscope slides; about 200 specimens of birds eggs. Total number of specimens about 600.

Botany. About 200 dry specimens of gymnosperms and angiosperms; about 50 specimens of thallophyta; about 50 specimens of bryophyta and pteridophyta; a small collection of seeds and fruits; about 200 microscope slides. Total number of specimens 600.

Ethnology and anthropology. 500 specimens, consisting of Indian pottery, rough and polished stone, war utensils, etc.

A small collection of meteorites, consisting of the Stewart Co. (Ga.) stone, the Putnam Co. (Ga.) stone (both described in the *American journal of science*), and several smaller fragments obtained by collection and exchange.

University of Georgia, Athens. Small collections in geology and archeology.

IDAHO

University of Idaho, Moscow. J. M. Aldrich, *curator*.

Paleontology. 250 specimens.

Mineralogy. 1000 specimens.

Historic geology and lithology. Small collection.

Zoology. 40 specimens of mammals; 125 mounted specimens of birds; 80 specimens of fishes; 25 specimens batrachians and reptiles.

Entomology. 16,000 specimens, many unnamed, though about 2000 species have been determined by authorities of high standing.

Botany. More than 10,000 sheets of flowering plants; also collections of woods, tree fruits, fungi, etc.

Archeology. 100 specimens; also some arrowheads and minor articles.

ILLINOIS

Augustana college, Rock Island. J. A. Udden, *curator*. The museum is intended as an adjunct in instruction, but is also devoted to the care of local natural history material.

Paleontology. 4000 specimens: general collection; McMaster collection from Rock Island and vicinity.

Mineralogy. 500 specimens: general.

Historic and economic geology and lithology. 1000 specimens: rocks, 500; formational collection of rocks and some fossils, 300; collection illustrating dynamic geology, folds, mud cracks, concretions, etc., 200.

Zoology. 3000 specimens: 2000 general; egg collection, 100 species.

Botany. 3000 specimens: exsiccate phanerogams.

Ethnology and anthropology. 1000 specimens: 500 coins; Kaffir articles of ornament, etc.; Hindu workmanship; American Indian relics.

Austin college, Effingham. No report.

Carthage college, Carthage. No report.

Chicago academy of sciences, Lincoln park, Chicago. Thomas C. Chamberlin, *president*; William K. Higley, *secretary*; Frank C. Baker, *curator in charge*; Frank M. Woodruff, *taxidermist*.

Paleontology. 12,000 specimens representing 1600 species of fossils: specially rich in forms of Silurian and Carboniferous formations; nearly complete collection of Niagara fossils from Chicago region containing about 30 type specimens; a mounted skeleton of *Elephas primigenius* and a good specimen of a skull of *Castoroides ohioensis*. The Cincinnati

collection includes several type specimens of Miller's cephalopods (Endoceras).

The type specimens exhibited are: *Endoceras egani*, *bristolense*, and *inaequabile*; *Eucalyptocrinus egani*, *rotundus*, *depressus*, and *turbinatus*; *Saccocrinus infelix*, *pyriformis*, and *urniformis*; *Glyptaster egani*; *Cyathocrinus vanhorni*; *Myelodactylus bridgeportensis*; *Cleidophorus chicagocensis*; *Holocystites jolietensis*; and *Strotocrinus bloomfieldensis*, described by S. A. Miller; redescribed types: *Saccocrinus marcouanus* Winchell and Marcy; *Cyathocrinus cora* Hall; *Ichthyocrinus corbis* Winchell and Marcy, and *Melocrinus obpyramidalis*, Winchell and Marcy; *Cyathocrinus turbinatus*, *Ampheristocrinus dubius*, *Cyphocrinus chicagocensis* and *Rhynchosaccus americanus* are all Weller's types. Many duplicates for exchange.

Mineralogy. 350 species and varieties and 3500 specimens of world-wide distribution, but particularly representing the United States. Quartz, calcite, gypsum, feldspar, copper carbonates, and the sulfids are the best represented groups. A few duplicates for exchange.

Historic geology. Collections illustrate all formations, but principally the Hudson river group, the Niagara of the Chicago region, the Burlington, the Mazon creek Carboniferous, and the Tertiary of the southeastern United States.

Lithology. 1000 specimens: illustrating the principal geologic periods, also all minerals useful to man; numerous original models of phenomena in dynamic geology. Some material for exchange.

Zoology. 100,000 specimens illustrating the fauna of the United States. Protozoa represented by colored figures; a small series of Porifera, Coelenterata, Echinodermata and Vermes; 4000 species and 75,000 specimens of Mollusca, including 150 species, 5000 specimens comprising a complete collection of the local

fauna, represented by specimens of all ages and varieties including several types; 6000 species, 20,000 specimens of North American Insecta besides good collections of Arachnida and Crustacea; a series of American Reptilia and Batrachia; a large collection of birds from North America, including a complete series of the avifauna of the Chicago region; a small series of North American mammals, including several from Alaska (moose, mountain sheep, etc.). Nearly every department contains some type specimens. Material for exchange.

Botany. 5000 specimens: a representative series of local and United States phanerogams and vascular cryptogams, and a large collection (700 species) of lichens. Limited number of flowering plants for exchange.

Ethnology. 1000 specimens: some excellent axes and arrow points of the American Indians from the Central states.

The arrangement of the academy's collections is consecutive, the sequence beginning with mineralogy and continuing through historic geology, zoology and ethnology from the lower to the higher types. A hand indicates the direction of the classification and four of these are placed in each case. Labels are printed in clear type and each case is furnished with explanatory labels giving notes of classes, orders, families, etc., and in addition pictures, maps and models are profusely used where they will in any way add to the understanding of the objects exhibited. A limited number of well selected specimens are exhibited for the public, mounted on heavy binders board tablets, covered with light-faced manila cardboard, which is not seriously affected by light. The study series, where the majority of the specimens are placed, is installed in drawers beneath the exhibition cases, each set in a dark-colored cardboard tray, the data being printed on a small label glued to the tray.

The exhibits of the museum are designed primarily for the instruction of the general public and for this reason each case is made as nearly encyclopedic as possible. The study series is prepared for the student and specialist and is installed with the strictest regard for scientific accuracy, but does not contain descriptive labels of any kind.

Chicago university, Walker museum, Chicago. Thomas C. Chamberlin, *professor of geology and director*. Curators: Rollin D. Salisbury, *professor of geographic geology*; Joseph P. Iddings, *professor of petrology*; Richard A. F. Penrose jr, *professor of economic geology*; Samuel W. Williston, *professor of palcontology*; Frederick Starr, *associate professor of anthropology*; Stuart Weller, *assistant professor of paleontologic geology*; William F. E. Gurley, *associate curator*.

Paleontology. 10,000 catalogued numbers, with 50,000 (estimated) not yet catalogued, 500,000 (estimated) specimens in all; including about 2000 type specimens representing about 1000 species. The most important collections are, the Gurley collection, the James collection, the Faber collection, the Sampson collection, the Washburn collection, the Van Horne collection and the Weller collection. The formations best represented are the Paleozoic of the Mississippi and Ohio valleys.

In vertebrate paleontology, there are nearly 500 catalogued specimens, with a smaller number yet uncatalogued, for the most part collected under the direction of the late Professor Baur, or obtained by purchase. The larger part of these are from the Permian of Texas and Illinois and the Laramie Cretaceous of Wyoming, with others from the White River Oligocene, the Kansas Niobrara Cretaceous and from Europe.

Duplicates for exchange from the Niagara group of Waldron Ind.

Mineralogy. 2000 specimens, best representing the commoner minerals and the tellurids and intended to illustrate chiefly the crystallographic development of minerals.

Economic mineralogy. 3000 specimens covering a wide range.

Lithology. 2500 specimens, embracing igneous, sedimentary and metamorphic rocks, but chiefly the former; and intended to illustrate the whole range of rocks.

Economic geology. A large series of ores and other mining products, representing the leading mining districts of the United States and of many foreign countries.

Geology. A systematic series of fossils arranged on a stratigraphic basis, illustrating the successive faunas and floras.

Zoology and botany. Extensive collections for class use only and therefore not considered as part of the museum.

Ethnology and archeology. 3000 specimens: exhibiting the archeology of several well marked archeologic districts of Mexico; illustrating the food supply, arts and industries of the cliff dwellers of Utah; collections from the Aleutian islands and from Japan, illustrating the ethnology of those regions; articles illustrating the ethnology of the Pueblo Indians of Mexico, and the Swiss lake dwellers; and several loan collections.

Total, 400,000 specimens.

College of liberal arts, Northwestern university, Evanston. U. S. Grant *curator*; A. R. Crook *mineralogy*; C. B. Atwell, *botany*; W. A. Locy *zoology*; and W. A. Phillips *anthropology*.

Paleontology. 3000 fossils from the Subcarboniferous of Illinois; a large number of specimens from the Coal Measures of Illinois; 300 specimens, including several types, from the Niagara group in the vicinity of Chicago; and 1000 specimens from the Cretaceous and Tertiary formations of Alabama.

Mineralogy. Some interesting material from the Lake Superior region; from Hot Springs Ark.; from the Yellowstone national park; and from the Black Hills of South Dakota. Much fine material was obtained from the World's Columbian exposition.

Mineralogy and lithology. 22,000 specimens: including a series of specimens from the typical localities of Europe; a set of rocks of Illinois; a set from the Black Hills of South Dakota; and a set from the Yellowstone national park; a set from the Lake Superior district and the U. S. geological survey educational series of rocks. Also a set of rocks from the copper bearing formation of Lake Superior and ore from the upper Mississippi lead and zinc district; these two sets are the property of the Wisconsin geological and natural history survey.

Zoology. 28,000 specimens: 3000 birds; 700 reptiles and batrachians; 900 fishes and 18,000 shells.

Botany. 20,000 specimens, including the college and Babcock herbariums, and various collections received from the World's Columbian exposition.

Ethnology. 8000 specimens exclusive of the local collection: relics of North American Indians; collections from southern Illinois, Missouri and Kentucky; complete series of specimens from England illustrating the process of making gunflints; and a large variety of material from various parts of the world. Much described material not on exhibition owing to lack of room.

The university medical school has a museum of comparative anatomy at Chicago.

Connected with the museum at Evanston is a "museum of ceramics and other arts".

Elgin scientific society, Elgin. Collections are small, the geologic material consisting principally of specimens gathered in the vicinity of Elgin, with a limited amount from Colorado, California and elsewhere.

The society has also a collection of shells and corals and some curios from Egypt and elsewhere.

Field Columbian museum, Chicago. F. J. V. Skiff, *director*.

Paleontology. 7000 specimens of fossils, with casts and models arranged chronologically to illustrate the animal and vegetable forms which have characterized the life of the globe at the succeeding stages of its history; exceptionally large and complete series of fossils of Niagara age from the Chicago region, of Mazon Creek Coal Measures plants, of European and American ammonites, of European ichthyosaurs, of American dinosaurs and of Bad Lands vertebrates; complete skeletons of the mastodon, Irish deer and extinct moa of New Zealand, and the largest known skull of Titanotherium and largest known limb bones of dinosaur.

Mineralogy. 6000 specimens. The arrangement is based on that given in Dana's new *System of mineralogy*, the purpose being to illustrate the different species therein described. Specimens worthy of special notice are: among the sulfids, large crystals of stibnite from Japan; among the haloids, the beautiful green and purple fluorites from English and American localities; among the oxids, the extensive collection of natural and ar-

tificially colored agates from South America; among the carbonates, curiously distorted calcite crystals from Egremont Eng. and the flos ferri aragonites; among the silicates, large crystals of Amazon stone from Pike's Peak, Col., and the transparent and perfect crystals of topaz from Siberia; among the phosphates, the richly colored vanadinites from Arizona; and among the sulfates, the brilliant groups of celestite from Sicily.

In addition to these the museum contains the Higinbotham collection of gems and gem minerals, one of the most valuable in the world. The Chalmers crystal collection contains about 200 specimens from the United States.

The collection of meteorites includes over 230 "falls" or "finds", represented by 5000 specimens having an aggregate weight of 4745.6 pounds, and 63 casts or models of notable meteorites. The specimens are divided into three classes, viz, siderites, siderolites and aerolites, and are arranged chronologically.

Structural and dynamic geology. 1500 specimens illustrating dendrites, volcanic products, cave products, varieties of rock structure, concretionary structure, and rock texture. A realistic reproduction of a limestone cave, in which about 100 specimens of stalactites and stalagmites are mounted in their natural position and with proper accessories, is an important feature of the exhibit.

Economic geology. 10,000 specimens, probably the largest and most complete of the kind in the world, illustrating modes of occurrence in nature of the minerals and ores of economic importance. Nearly all the important mining districts of the world are represented by typical specimens. Specially complete series are: mineral oils of the United States and their products, coals of the United States, platinum ores, zinc ores of the United States, marbles and clays. Ores of gold, silver, lead, copper, iron, zinc, mercury, nickel, and the rarer metals are also fully illustrated, many of the specimens being of great size and of a high degree of perfection. A full sized statistical column originally prepared by the United States geological survey, illus-

trates the quantity of different mineral products mined in the United States for each second of time during the year 1892. Numerous metallurgic processes are illustrated by specimens and charts.

Geographic geology. 50 relief maps with charts, globes and other geographic material illustrating topography, topography and geology, or topography and culture of various regions of the earth, and an accurate relief map 19 feet in diameter, of the surface of the moon.

Lithology. Two collections: one of rock specimens systematically arranged and one of polished and ornamental stone. The former includes about 1800 specimens of uniform size, 4 x 3 x 1 inches, representing the different kinds of rocks. The latter is made up of about 200 specimens of polished slabs of different sizes, intended to illustrate the different ornamental stones, chiefly marbles and granites.

Zoology. Representatives of all the important classes of animals, with few exceptions arranged in systematic order, beginning with the lowest forms and ending with the highest. The chief groups are: 1) Porifera from the Mediterranean and the West Indies. 2) Coelenterata, in wall cases about 8 feet high and with a total length of 130 feet, from all parts of the world, many of the Actinozoa being represented by glass models. 3) Echinodermata in table cases which have a glass surface of over 300 square feet. 4) A small collection of Annulata. 5) Arthropoda; the crustaceans filling a wall case 8 feet high and 50 feet in length, insects, 10,000 species, most of which are on exhibition, Coleoptera best represented, Lepidoptera coming next with 2000 specimens. 6) Mollusca, about 7000 species, most of which are mounted on tablets and displayed in table cases, presenting an exhibition surface of over 1200 square feet. The Nudibranchia are represented by glass models. The Brachio-poda are installed with the Mollusca. 7) Pisces are represented by 1600 species. A series representing the leading groups are exhibited by means of casts, mounted specimens and alcoholics. 8) Reptilia. About 300 species, some of which are mounted.

The rest are alcoholics. 9) Aves, chiefly the C. B. Cory collection made under Mr Cory's direction in southern United States and the West Indies, a collection from East Africa by the museum's East African expedition and a collection of North American bird skins. About 600 birds are mounted and a few mounted groups beautifully illustrate color protection and other characteristics. There is also a collection of North American and foreign birds eggs. 10) Mammalia comprises over 8000 specimens. A large series representing all orders is mounted and arranged in systematic order, beginning with the duckbill and ending with the chimpanzee. In addition there are 12 real and artistic groups of large mammals, three to eight animals in each, mounted by Mr C. E. Akeley, showing much of their natural history. The valuable osteologic collection consists of mounted skeletons of over 225 species of animals, including, with few exceptions, all the important orders of the Vertebrata, and arranged in systematic order, paralleling the mounted specimens.

Botany. **Economic:** collections of the foreign governments in forestry, as exhibited in the government and forestry buildings at the World's fair; the major part of the gums, oils, medicinal plants, tan barks, dyewoods, seeds and fibers exhibited by the foreign countries in the agricultural and manufacturers building; the economic plant exhibit of the United States government as displayed in the government building; and portions of many American exhibits in this important branch of natural science. Among the specimens exhibited is a very fine and costly decortication of a cork tree with three branches, considered to be the best example of dexterous bark peeling ever procured. Starting with the above material as a base, material that is unique in its completeness and museum character, other large series representing the source, utilization and character of a large number of vegetable products are being installed. These series begin with the source of each product and carry it through its processes to its completed form for utilization by man.

Systematic collections. The herbarium contains over 150,000 sheets of plants principally from North America, the West Indies and Europe; comprises the former private herbariums of Dr Arthur Schott, notable for its United States boundary survey and Isthmus of Darien survey plants, and his Yucatec and Hungarian series; that of Mr M. S. Bebb, notable for the largest representation of the genus *Salix* in this country; that of Mr Arthur A. Heller and of Mr Harry N. Patterson, notable for its complete representation of the plants of Gray's manual and its full sets of Curtiss, Pringle, Cusick, Chapman, Hall & Harbour, the Gaumer Yucatan plants; the plants of the Allison V. Armour expeditions, etc.; a large number of classic series of the plants of North America, South America, the West Indies and Central America.

Anthropology. Collections are intended mainly to illustrate the more primitive or uncivilized phases of the development of the human race. There are two divisions of the subject, and the collections illustrating them are separately installed. The first division consists of apparatus used in studying the greatly varied physical and psychic phenomena. The second comprises exhibits of the handiwork of man and of collections of crania, casts and other objects, articles and materials illustrating the physical characteristics of the race. The works of prehistoric peoples are brought together in groups according to locality from which they are derived, people, time, or stage of progress they are thought to represent, or, otherwise, with reference to some other special subject to be illustrated. Those of living or historic peoples are assembled according to the tribe or nation to which they pertain.

The physical and psychic anthropologic collection consists of various kinds of apparatus obtained and set in place by Dr Joseph Jastrow, the Boas collection of skulls, trephined skulls from Peru, Papuan skulls, etc.

Ethnology. The more notable collections are: Stanley McCormick Hopi material; Edward E. Ayer collection of North American material; Hassler collection of feather work, and other

ethnologic specimens from the Indians of Paraguay; Bruce collection from Alaska; Welles collection from Venezuela; Quelch collection from British Guiana; Finch collection from New Guinea; Peace collection from New Caledonia; Remenyi collection from South Africa; Pegosky collection from Siberia, and the H. N. Higinbotham collection from Korea.

Archeology. The more notable collections are: Montes and Dorsey Peruvian collection: United States Columbian collection of objects of gold, earthenware and stone; Harris collection of Peruvian antiquities; Riggs collection from the Southern states; Johnson collection of reproduction of Irish antiquities; Allison V. Armour collection of Mexican antiquities; original and reproduction of ancient Italian bronzes; Cyrus H. McCormick collection of Chilian antiquities; Green cliff house collection; Charnay casts from Central America; and Wyman collection of copper implements and relics of stone, and models of Pueblo villages and ancient ruins, with numerous ancient relics and modern utensils from the Pueblo region; also large series of implements, objects and models illustrating the arts of quarrying and mining and the manufacture of stone implements by the aborigines.

Greer college, Hoopeston. No report.

Hedding college, Abingdon. No report.

Illinois state museum of natural history and geological survey of Illinois, Springfield. C. H. Crantz, *curator and state geologist*. The collections constitute the Illinois state museum of natural history.

Paleontology. 5000 species of fossils collected during the geological survey of the state by Prof. A. H. Worthen.

Mineralogy and geology. 2500 specimens from the state.

Zoology. Mammals, birds, nests and eggs, reptiles, fishes and insects.

Illinois Wesleyan university, Powell museum, Bloomington. J. Culver Hartzell, *curator*.

The Powell museum was named in honor of Maj. J. W. Powell, who was the instructor of natural science in the Illinois Wes-

leyan from 1865 to 1868. Maj. Powell made his early Rocky mountain explorations from the Wesleyan, and the museum, which was established in 1852 with 1700 specimens, contains collections made during these trips. There are now about 40,000 labeled specimens accessible to visitors and about 100,000, also labeled, arranged in trays and cases specially for students. The rest of the material is not catalogued and the amount not known. The material has been received from various sources: the Wheeler, Powell, Canadian and state surveys, the United States geological survey, the United States national museum, the Smithsonian institution, private collections and exchanges.

Paleontology. Nearly all formations of North America are represented by exceptionally fine vertebrate and invertebrate fossils, specially the latter; an extensive collection of Illinois fossils; 10 casts of extinct vertebrates; fossil plants from the Silurian, Carboniferous and Cretaceous, particularly the latter two; a large number of well preserved fossil insects from Colorado and Wyoming.

Mineralogy. Nearly all the species and varieties of Dana are represented; a good collection of crystals.

Geology. Series of rocks representing nearly all formations of Europe and North America, and the lithologic characters of the various groups; a large collection of geologic maps; an extended series of photographs of western geologic scenery; a good collection of ores from the western states.

Zoology. 10,000 species of shells from various parts of the world; 1000 species of insects from Europe and America; 600 species of birds mostly from America; 100 clutches of eggs; 200 mammals; 60 skulls of mammals from North America, South America and Australia; a series of human skulls, modern, cliff dwellers and mound builders; several hundred alcoholic specimens.

Botany. 1000 species of marine algae from various parts of the world; 600 species of ferns from North America, Hawaiian islands, India, China, Japan, Australia, New Zealand, South

America and Europe; 500 mosses and lichens from North America and Europe; 6000 species of phanerogams from North and South America, Europe and Australia; a nearly complete collection of North American woods.

Ethnology. A large collection of Zuñi and Moqui utensils, pottery, articles of dress, etc.; a number of vases, masks, sculptured heads etc. from Mexico; utensils of the cliff dwellers and mound builders; a recently acquired collection of 1140 specimens of tablets, pipes, mills, celts, knives, saws, discoids, mortars, etc.; old coins; articles of dress; relics from battlefields, etc.

Knox college, Galesburg. Albert Hurd in charge.

Paleontology. 2100 specimens: a general collection of fossils illustrating all formations, specially the Carboniferous; no type specimens.

Mineralogy. 1250 specimens: general collection illustrating fairly well the common minerals.

Zoology. 17,000 specimens: 400 species of birds; 2500 species of shells, marine, fresh-water and terrestrial; 2000 species of insects, etc. The specimens in nearly all classes and orders are selected mainly for general illustration in zoology.

Botany. 20,000 specimens, 9000 species, including the "Mead herbarium" of Dr S. B. Mead, Augusta Ill., nearly one half of which are foreign. 2100 species, 8000 specimens from the "Mead herbarium," representing a large number of families, for exchange.

Ethnology and anthropology. 100 specimens: 50 Neolithic implements from Denmark, and a few others.

Lake Forest university museum, Lake Forest.

Small collections.

Geology. A good set of the Guelph group of Niagara fossils from the vicinity of Port Byron Ill.; a collection of the Mazon creek (Ill.) ferns; and several smaller ones from various parts of the state.

Lincoln college of the James Millikin university, Lincoln. C. S. Oglevee, *professor of biology*, in charge.

Collections small and not properly classified and catalogued.

Northwestern college, Naperville. L. M. Umbach, *professor of natural sciences*, in charge.

Paleontology. 300 specimens: including Silurian species from Illinois, Iowa and Indiana; many Devonian Mollusca, etc., from Ohio; and good collection of Carboniferous plants from Mazon creek, Grundy co. Ill.

Mineralogy, economic and historic geology, and lithology. The combined collections aggregate about 600 specimens, including rocks from the glacial drift of this region; a series of agatized woods from Colorado; lithologic material from Massachusetts and Connecticut; and an economic collection illustrating the mining regions of northern Wisconsin and Michigan.

Zoology. A small series of local mammals, birds, reptiles, and fishes—about 150 specimens in all.

Botany. 17,000 specimens illustrating about 5000 species of plants: a fair representation of the flora of North America; quite complete herbarium of plants from the vicinity of Chicago; about 350 Yucatan species and a small herbarium of European species.

Exchange list includes 2000 specimens of about 1200 different species.

Ethnology. 350 specimens, including several skeletons, articles of wearing apparel, stone implements, etc.

Taylor museum, Blackburn university, Carlinville. J. D. Conley in charge; Charles Robertson, *assistant*.

Paleontology. 12,000 specimens: representing nearly every epoch throughout the Paleozoic and Mesozoic eras; a large part of the Van Cleve corals figured in the Indiana report; richer in drift corals than anything else but with an equal number of Silurian, Devonian and Carboniferous fossils; a large number of duplicates of the above fossils but comparatively few species in the Jurassic, Cretaceous and Tertiary.

Mineralogy. 5000 specimens: copper and iron ores; volcanic products.

Historic and economic geology and lithology. One of the largest collections in the state consisting of 75 cases averaging 4x5 feet wall space; specimens labeled but not catalogued.

Zoology. A small collection.

Botany. A small collection.

Ethnology and anthropology. 500 specimens: Indian axes; spear and arrowheads; pottery, pestles and ceremonial implements.

University of Illinois, Champaign. The professors of the several departments are in charge of their respective departments of the museum, there being no regular museum curators. C. W. Rolfe, *professor of geology.*

Paleontology. 49,000 specimens: private collection of Prof. A. H. Worthen, ex-state geologist; duplicates from the state museum, of the collection made by the Worthen survey of the state; private collection of the Rev. H. Herzer, of Ohio; private collection of Mr Tyler McWhorter; Ward's series of casts of fossils; special collections obtained by purchase and exchange; and 742 type specimens from the geologic survey of Illinois. The collections are particularly rich in Paleozoic material.

Mineralogy. 12,000 specimens, arranged solely for purposes of class study, no attempt being made to collect showy specimens on account of the limited means available, and 575 crystal models. It includes all but the rarest species.

Historic and economic geology and lithology. 5500 specimens and 1000 thin sections obtained by purchase and illustrating nearly all formations. The economic collection includes a good series of ores, building and ornamental stones, soils and other economic materials.

Zoology. 11,000 specimens, illustrating chiefly the mammals, birds (with nests and eggs), reptiles, fishes and casts of fishes and mollusks. The Bolter collection of insects contains over 16,000 species represented by about 120,000 specimens. The lower invertebrates are represented in part by a large series of Blaschka glass models. The extensive collections of the Illinois state laboratory of natural history are also available to the university students. No duplicates for exchange.

Botany. 40,000 specimens: students reference herbarium, confined to the flora of this, Champaign, county; experiment station herbarium, consisting chiefly of weeds, specimens illustrating diseases of cultivated plants, cultivated plants, and plant seeds; a museum collection of the woods of Illinois; and the university herbarium, which makes a specialty of the flora of Illinois. The collections are specially rich in certain groups of fungi and in the exsiccati of fungi. Duplicate specimens for exchange.

Ethnology and anthropology. 800 specimens: including arrow points, spearheads, etc., mostly from the bluffs of the Mississippi river in Calhoun county, Ill., and vicinity, Indian tools and household utensils, casts of skulls and brains, and models of the cliff dwellings of the southwest. No duplicates for exchange.

Wheaton college, Wheaton. No report.

INDIANA

Franklin college, Gorby collection, Franklin. D. A. Owen in charge.

Paleontology. 35,000 specimens best representing formations of the Silurian, Devonian and Carboniferous systems, the specimens consisting of corals, crinoids, brachiopods, lamellibranchs, gastropods, cephalopods, trilobites and a few vertebrates.

Mineralogy. About 1000 specimens collected in various parts of the United States, with some from other countries.

Zoology. 200 specimens of birds, and 750 birds eggs; 500 mollusks.

Ethnology. 300 specimens of arrowheads, axes, and other relics of the American Indians and 300 specimens of the cliff dwellers.

Hanover college museum, Hanover. Glenn Culbertson, *professor of geology.*

Geology. A working collection of 500 specimens, many of which are excellent of their kind, obtained to a great extent from the formations near Hanover and including a good series of fossils from the Hudson river group; many from the Clinton group; a large collection of Niagara, Carboniferous and other Devonian

fossils; a few from the Carboniferous system; a number of Jurassic and Cretaceous and some bones and teeth of Mastodon and Elephas.

Indiana university museum, Bloomington. C. H. Eigenmann, *professor of zoology* in charge; V. F. Masters, *professor of geology*; D. M. Mottier, *professor of botany*.

Paleontology. 10,000 specimens: very complete collection of corals from Falls of the Ohio; fair collection of Brachiopoda; many thousand fossils of the Cincinnati group; numerous specimens of all the species of the Spergen hill fauna; nearly complete representation of the Waldron fauna; small series from the Genesee, Hamilton and Portage of New York; small series from the New York Trenton.

Cincinnati, Waldron and Spergen hill species for exchange.

Mineralogy. 250 species: ores and rock-making minerals constituting a working collection for students.

Historic and economic geology and lithology. Series of rocks illustrating the geologic formations of the United States; series (United States geological survey) illustrating the lithologic types.

Zoology. 55,000 specimens: several thousand species of fishes; several hundred birds; limited number of mammals, reptiles and batrachians; miscellaneous collection of invertebrates.

Botany. A small but constantly increasing collection of dry and alcoholic specimens of the higher and lower forms of plant life illustrating certain phases.

Purdue university, Lafayette. Stanley Coulter, *director of the biologic laboratories*.

Paleontology. 4000 specimens, confined almost exclusively to the forms found in the Indiana series of rocks. While there are no type specimens, the collections are fairly complete in Silurian, Devonian and Carboniferous forms.

Mineralogy. A representative series of 1000 specimens of general interest. No duplicates for exchange.

Economic geology and lithology. Material is included in other collections, or distributed in the testing laboratories. No duplicates for exchange.

Zoology. 13,000 specimens: an almost complete series of mammals and birds of Indiana, numbering 500 specimens; the A. W. Butler collection of the lower vertebrates of Indiana, giving full suites of the serpents, lizards and batrachians; 500 fishes, representative of the larger genera and families; the Scheuch collection of Coleoptera, 6000 specimens; and the Scheuch and other collections of mollusks, 6000. No material for exchange.

Botany. 8000 specimens: 5000 phanerogams; 2000 cryptogams, etc.; 500 specimens of seeds and economic products; 60 of wood, and 500 microscopic sections. No material for exchange.

Ethnology. 1000 specimens: small collections of relics from Fort Ouiatenon and from the Pueblo Indian villages; also collection of local stone implements. No exchange.

The museum is organized for illustrative purposes in the various branches of science, and other features are subordinate to this.

Taylor university, Walker museum, Upland. O. W. Brackney, *curator*.

Paleontology. 500 specimens.

Mineralogy. 1000 specimens: iron ores best represented.

Zoology. 100 specimens: mounted birds and animals.

Botany. Mounted plants and specimens of wood found in this vicinity.

Ethnology and anthropology. 300 specimens: Indian relics, etc. Museum also possesses a collection of coins and stamps.

Wabash college, Hovey museum, Crawfordsville. Mason B. Thomas, *curator*; Donaldson Bodine, *professor of geology and zoology*.

Paleontology. 4300 specimens: 300 casts of fossil vertebrates; 300 fossils from the Coal Measures; 500 crinoids, 200 trilobites and 3000 corals, brachiopods, gastropods, cephalopods, etc. from the Keokuk group at Crawfordsville; fossil fishes from Persia; and a series of mammalian fossils from California.

The illustrative material is valuable and fairly representative. The series of fossils is carefully arranged to portray the development of life from the early primordial times to the present.

Some groups of Devonian and sub-Carboniferous forms are well represented, and have furnished types for various species of crinoids, etc., for which the beds in the near vicinity are famous.

Mineralogy. 4000 specimens, and fairly representative, being specially rich in ores and rare species, and including an extensive study collection.

The economic collection includes 400 specimens: a valuable series of marbles and granites, and a series of iron ores with their furnace products, slags, etc.

Zoology. 10,575 specimens: birds 100, reptiles and amphibians 225, fishes 500, crustaceans 100, mollusks 9000, corals 300, sponges and echinoderms 300.

The collection of shells arranged and classified for systematic work, offers unusual facilities for students and includes many very rare species.

Zoological materials are arranged systematically to illustrate the development of the animal kingdom. The series of invertebrates is very complete, and the vertebrates include many articulated skeletons, and dissected specimens illustrating important anatomic structures.

Botany. A herbarium specially complete in North American species, and containing much material from European, Asiatic and South American countries, of 30,000 phanerogams, and 1500 cryptogams, and a series of 1000 specimens of economic products.

Material used to illustrate lectures in general botany greatly increases the value of these collections. Some parasitic fungi for exchange.

Ethnology. 6000 specimens: relics of the American Indians and the Mound Builders, including arrowheads, weapons, pipes, plummets, drills, ornaments, pottery, fabrics and skulls. Duplicates for exchange.

INDIAN TERRITORY

Indian university, Bacone. J. H. Scott, *president*.

Geology. Collections small and of general distribution, including fossils from the New York and Indian territory formations;

some miscellaneous material; a collection of minerals, including ores, calcites, agates and petrifications.

There is a small collection of fresh-water shells.

IOWA

Amity college museum, College Springs. George M. Reed, *curator* in charge.

Paleontology. 2000 specimens: 1000 mollusks; 50 crinoids; 50 petrified fragments of bones of mountain lions and bears; 50 fragments of fossil lepidodendrons and ferns of Carboniferous age; and 10 belemnites from the Black Hills of Dakota. 200 duplicate mollusks for exchange.

Mineralogy. 1000 specimens of a general nature representing ores of gold, silver, lead, zinc, particularly iron and copper; a good collection of anthracite and bituminous coals from various localities; collections of sedimentary and crystalline rocks.

Zoology. 500 specimens: 200 alcoholic specimens of marine invertebrates; 200 shells; and 50 miscellaneous land specimens.

Botany. 100 specimens of dried plants, seeds and abnormal growths; a series of cotton plants in various stages of growth.

Ethnology. 200 relics of the American Indians; a "prehistoric whetstone" from Kentucky; a few archeologic specimens from the island of Cyprus.

Cornell college, Mount Vernon. No report.

Davenport academy of sciences, Davenport. Mrs Mary L. D. Putnam, *president*; J. H. Paarmann, *curator*.

The academy possesses extensive collections in archeology, ethnology, mineralogy, paleontology, entomology, birds and corals, besides a very large scientific library.

Iowa college, Parker museum of natural history, Grinnell. Director H. W. Norris, *professor of biology and geology* in charge.

Paleontology. 2000 specimens, chiefly from the Silurian and Devonian systems but not at present well arranged.

Mineralogy. A general collection of about 1000 specimens. Duplicates for exchange.

Lithology. Material not abundant.

Zoology. 2000 to 3000 specimens representing all classes of the animal kingdom. Illustrative, rather than comprehensive, with a separate collection of mollusks.

Botany. 2000 mounted specimens of phanerogams and 500 unmounted, and 500 to 1000 cryptogams, illustrating North American and European (chiefly Alpine) forms; small collections from Australia and from St Thomas, West Indies. A large number of European species for exchange.

Ethnology. Collections small.

Muscatine academy of science, Muscatine. R. W. Leverich, *president*.

The academy formerly possessed a valuable geologic collection and library which was totally destroyed by fire in 1896. Collections are being renewed, and now include a few fossils from the Devonian and Carboniferous systems, and from local formations; minerals and ores from Colorado, Arizona and Mexico; about 250 specimens in all. A large number of government publications have been received.

State university of Iowa, Iowa City. C. C. Nutting, *professor of zoology* in charge, assisted by H. F. Wickham, *assistant professor of zoology*, Rudolph Anderson, *taxidermist* and W. B. Bell, *scholar in zoology*.

Paleontology and geology. 30,000 specimens: Iowa fossils and other geologic material.

Zoology. 100,000 specimens, named in order of comparative size and excellence, illustrating the following classes: mammals, birds, reptiles and batrachians, marine invertebrates, insects, fishes. Much duplicate material for exchange, particularly birds and marine invertebrates.

Botany. 175,000 specimens. The herbarium, wholly distinct from the museum, is in charge of Thomas H. Macbride, *professor of botany*, and B. Schimick, *curator of the herbarium and assistant professor of botany*.

The collections of spermophyta, pteridophyta, and fungi are most valuable and the largest in number. Myxomycetes, algae and bryophyta are also extensively represented. Considerable material for exchange.

Ethnology. 800 specimens: a valuable collection of skulls, ivory carving and implements from the Eskimo and Indian tribes of arctic America; pottery and utensils from Mexico, Arizona and New Mexico; and a small collection of skulls and pottery of the mound builders, from Missouri and Iowa.

Upper Iowa university, Fayette. Bruce Fink in charge.

Paleontology. 1000 specimens: Silurian and Devonian fossils of Iowa; Cretaceous fossils of Kansas; Carboniferous fossils of Pennsylvania; also a small geologic collection from Germany. Some local forms for exchange, specially *Atrypa reticularis*, and *Terebratula iowensis*.

Mineralogy. 500 minerals from American localities.

Phenomenal geology. 100 specimens: ripple marks, stalactites, geodes, concretions, peat, etc.

Zoology. 600 specimens: 25 mammals, 25 birds, 200 reptiles and fishes, 100 insects, and 200 marine invertebrates.

Botany. A herbarium of 12,000 specimens. Three fourths of the herbarium are forms lower than Anthophytae, lichens being the best represented group. An immense variety of lichens for exchange.

Ethnology. 125 paleolithic implements and relics of the American Indians.

Wartburg teachers seminary and academy, Waverly. The Rev. Frederick Lutz, *president* in charge.

Paleontology. 938 specimens: chiefly from formations of the Silurian and Devonian systems.

Mineralogy. 1434 specimens.

Historic and economic geology and lithology. 352 specimens.

Zoology. 1128 specimens illustrating every division of the animal kingdom, specially birds.

Botany. 1151 specimens: a general herbarium, and a collection of woods.

Ethnology. 452 specimens. There is an art collection connected with the museum.

Western college, Toledo. No report.

KANSAS

Baker university museum, Baldwin. C. S. Parmeter in charge, assisted by J. C. Bridwell.

Paleontology. 21,156 specimens. Several hundred duplicates for exchange.

Mineralogy. 4810 specimens. 2000 duplicates for exchange.

Historic geology and lithology. 500 specimens. 200 duplicates for exchange.

Zoology. 43,638 specimens: mammals, 60; birds, 406; eggs, 1052; reptiles, 264; insects, 32,798; mollusks, 8458; marine invertebrates, 600. 5000 duplicates for exchange.

Botany. 7789 specimens: Phanerogamia, Hepatica and Musci. 500 duplicates for exchange.

Ethnology. 900 specimens. 300 duplicates for exchange.

Bethany college, Lindsborg. J. E. Welin, *curator* in charge.

Paleontology. 500 specimens: Silurian, Devonian, Carboniferous, Jura-Trias, Cretaceous, Tertiary and Quaternary; the type specimen (a skull in good condition) of *Megalonox leidy* Lindahl. Some common fossils for exchange.

Mineralogy. 800 specimens from United States, Sweden, Africa and South America; contains specimens of almost all the mineralogic groups and serves the purpose of class elucidation.

Historic and economic geology and lithology. 100 specimens: different groups of rocks.

Zoology. 1000 specimens: mounted specimens of mammals and birds; unmounted skins of same and mammals for class study; alcoholic specimens of reptiles and all groups of marine and fresh-water invertebrates.

Botany. 1500 specimens: almost every family of flowering plants; several genera of ferns; a few mosses.

Ethnology and anthropology. 2000 specimens: a finely mounted and classified collection of Indian relics from this vicinity consisting of pottery; flint and bone implements; stone (Sioux quartzite) hammers, metates with hand pestles, some pipes and pipestone. The college has recently received a fine collection

of pottery, stone implements, doorplates, baskets, and two skulls from the cliff dwellings of New Mexico. In connection with this, there has been received a very fine collection of modern Indian pottery, stone implements, and other things of interest from the Pueblo and Apache Indians. Material for exchange.

The museum also possesses a fine collection of coins, paper money and postage stamps from every known country of the globe. It is probably the best of its kind in the state consisting of 3000 pieces of money, tokens and souvenirs.

College of Emporia, Emporia. George S. Fisher, *professor of natural science*. Collections are merely those made by students for illustration in the elementary courses.

Mineralogy. 300 specimens.

Historic geology and lithology. 200 specimens.

Zoology. 250 specimens of fishes received from the Smithsonian institution, and an equal number of insects.

Botany. 250 specimens representing local flora.

Kansas state agricultural college, Manhattan. E. A. Popenoe, *professor of entomology and zoology* in charge; G. A. Dean, *assistant in entomology*; Theodore H. Scheffer, *assistant in zoology*.

General geology. 3000 specimens: a series of common rock-forming minerals; common types of rocks; common fossils, placed with a view of affording students of the science, as given in our course, a fundamental knowledge of the subject.

Permo-Carboniferous and Cretaceous fossils for exchange. Also specimens of rocks of the vicinity.

Zoology. 8000 specimens illustrating collections in the various branches. The local reptilian fauna and mollusca are fairly well represented.

Entomology. Very complete collection of insects consisting of from 10,000 to 20,000 specimens.

Kansas Wesleyan university, Salina. Alfred W. Jones, *professor of geology and entomology*, curator.

Paleontology. 900 specimens: fossil leaves representing the Dakota group; invertebrate fossils of the Upper Carboniferous

and the Lower Cretaceous formations. These form the greater part of the paleontologic collections. A few specimens from the two latter formations for exchange.

Mineralogy. 1200 specimens general in nature, no groups being particularly prominent. A limited amount of material for exchange.

Economic and historic geology. 500 specimens.

Zoology. 7000 specimens: the A. W. Jones collection of about 5000 specimens of Coleoptera, and about 1000 insects of other orders; 50 alcoholic examples of reptiles and batrachians; 100 mounted birds and mammals and half a dozen skeletons; and several hundred marine invertebrates. Duplicate specimens of Coleoptera for exchange.

Botany. 200 native plants. A few duplicates for exchange.

Ethnology. 300 specimens: series of casts of prehistoric implements from the Smithsonian institution; several native Indian implements and trinkets; and a few relics of the mound builders.

Midland college museum, Atchison. E. B. Knerr, *professor of natural sciences and mathematics*, in charge.

Paleontology. 800 specimens: local invertebrate fossils; the Miocene invertebrates of Virginia; fossil leaves from the Dakota group of the Cretaceous in Kansas, and other specimens of the fossil fauna of Kansas.

Mineralogy. 500 specimens illustrating the common minerals, mostly obtained by purchase.

Zoology. 120 specimens: local birds and snakes; a few mounted skeletons.

Botany. 1000 specimens: most of the flowering plants and ferns of Ohio, Iowa and Kansas; a collection of liverworts from Prof. Underwood.

Ethnology. A few relics of the American Indian.

University of Kansas, Lawrence. F. H. Snow, *director*; L. L. Dyche, *curator of zoology*; S. W. Williston, *curator of paleontology*; E. Haworth, *curator of mineralogy*; W. C. Stevens, *curator of the herbarium*; S. J. Hunter, *reptiles and invertebrates*; F. H. Snow, *curator of entomology*; C. E. McClung, *curator of microscopic collections*.

Paleontology. 40,000 specimens. They have been built up by purchase and exchange, but chiefly by the personal collections of the director and the curators in summer expeditions to western Kansas, Dakota, Wyoming and Colorado. They are specially rich in Cretaceous flora and fauna, the Dakota leaves, of which there are many type specimens by Lesquereux; and the Niobrara vertebrates, specially reptiles, among which are the types described by Dr Williston. There are also many Loup Fork mammals from Kansas, White river mammals from Dakota and Wyoming, and Jurassic reptiles from Wyoming. Also extensive series of Carboniferous and Permian leaves and insects, many Lower Cretaceous and Tertiary leaves, Permian and Carboniferous vertebrates, and several mounted Pleistocene mammals. It is one of the largest university collections in the United States. Duplicates for exchange.

Mineralogy. 12,000 specimens. The chief collection is that purchased from J. W. Cooper for \$3000, consisting chiefly of specimens from the Rocky mountains. Duplicates for exchange.

Economic geology. 2000 specimens: illustrating the resources of Kansas for producing salt, gypsum, coal, building stone, lead, and zinc. Duplicates for exchange.

Zoology. This is one of the largest university collections in the United States, including North American mammals and birds, both skins and skeletons—mounted and unmounted; a collection of birds nests and eggs; a series of alcoholic specimens of reptiles; a series of marine and fresh-water shells.

Entomology. 200,000 specimens. The second largest of North American species in the United States, including 8000 species of North American coleoptera, 3500 North American Lepidoptera, 4000 Diptera, 3000 Hymenoptera and 1500 species of other orders. This collection contains many type specimens of Grote, Williston, Townsend and others. Duplicates for exchange.

Botany. 7000 mounted, and 15,000 unmounted specimens of North American plants. Duplicate material for exchange.

Ethnology. 500 specimens of mound builders implements.

Washburn college museum, Topeka. G. P. Grimsley, *professor of geology and natural history*, in charge.

Paleontology. 8000 specimens: Dakota fossil leaves from Kansas; a series of Cretaceous fossils; a series of fossils from the Carboniferous formations of Kansas; specimens of the Carboniferous flora of Ohio; and of the Lower Silurian and Devonian from the latter state.

Fossils from the Carboniferous of Kansas and from the Silurian and Devonian systems of Ohio for exchange.

Mineralogy. 500 specimens: ores and minerals of Kansas.

Historic geology and lithology. 500 specimens illustrative of the geology of Kansas.

Zoology. 2000 specimens: reptiles, fish and fresh-water shells of Kansas; mounted specimens of the buffalo, mountain lion, and smaller mammals; marine shells, corals and crustaceans.

Fresh-water shells of Kansas for exchange.

Botany. 2000 specimens: including a herbarium of the phanerogams, mosses and fungi of Kansas, and the Ellis collection of fungi. Kansas phanerogams for exchange.

This museum is very desirous of exchanging for geologic and zoologic material.

KENTUCKY

Bethel college, Russellville. No report.

Center college of Kentucky. No report.

Central university of Kentucky, Richmond. No report.

Kentucky university, Lexington. Alfred Fairhurst in charge.

Paleontology. 500 specimens of fossils, of general distribution. Faunas of the Trenton and the Corniferous limestones being best represented.

Mineralogy. 500 specimens: ordinary minerals, ores and non-metallic minerals about equally represented.

Lithology. 200 specimens of rocks, including one of the students collections distributed by the Smithsonian institution.

Zoology. 75 specimens of small mammals; 1000 specimens of birds, of which 700 are mounted; about 100 specimens of birds

eggs and a few nests; considerable material from Mexico, South America, the West Indies and Australia; a few European forms; 200 specimens of reptiles, amphibians, fishes and invertebrates in alcohol; about 50 specimens of corals and 200 species of shells.

Ethnology. 100 specimens of images, articles of domestic use, etc., from Japan and an equal number from other parts of the world; about 700 specimens of stone implements of the North American Indians.

Zoology. Smithsonian school collections.

Louisville public library. A. S. Brandeis, *chairman of the committee on cabinets and art*, in charge.

Paleontology. 1000 specimens: not yet well arranged for exhibition.

Mineralogy. 6000 specimens: the Troost collection, and the J. Lawrence Smith collection, in part, which are noted for their fulness and extent rather than for excellence in any particular groups; large and valuable collection of precious and semiprecious stones; also important series of meteorites, native metals and crystals.

Economic and historic geology and lithology. 500 specimens: the Shreve memorial cabinet, containing many rare and beautiful marbles and other ornamental stones.

Zoology. The C. W. Beckham collection of nearly 3000 carefully prepared bird skins, almost entirely American species, chiefly from the southern states; birds eggs; a few fishes and bones of fish; several hundred rare shells; a collection of starfish and a good collection of corals.

Botany. Several thousand specimens: the Williamson collection of ferns; the Beckham collection of ferns and flowers; the Mrs Belknap collection of ferns, etc.; and the Octavia Allan Shreve collection of ferns and algae.

Ethnology. 500 specimens representing all parts of the world, and many periods of time.

Ogden college, Bowling Green. Malcolm H. Crump, *professor of natural science*, director. The museum is for practical purposes only, being limited to the needs of the students.

Paleontology. 2000 specimens: working collection of typical Kentucky fossils from the Chazy to the Quaternary. Specimens of *Pentremites godoni*, *Lithostrotion canadense*, *Athyris*, *Productus*, and many sub-Carboniferous fossils for exchange.

Mineralogy. 2000 specimens: typical North Carolina specimens for working purposes, including coal, ores, clays, etc. Some specimens of calcite and limonite for exchange.

Historic and economic geology and lithology. 200 specimens: iron ores, building stone, etc. Stratified and oolitic limestone for exchange.

State geological department, Lexington, Charles J. Norwood, curator.

Paleontology. General systematic collection to represent Kentucky geology.

Mineralogy. General collection.

Economic geology. Collections of building stones, dressed and polished and in the rough; ores of iron, lead and zinc; clays and clay products; coals and coke constitute the main exhibited material. There are also collections of barite, fluor spar, marls, paints, salt, petroleum, etc.

Zoology. General collection including the celebrated race horse Hanover, mounted.

Botany. Principally economic. A large collection of Kentucky woods in the shape of boards, partly dressed and polished.

There are also 200 large transparencies showing farming lands, cattle and stock, timber, quarries, etc.

A number of large colored photographs, geologic and other maps and two relief maps of the state, one geologically colored, the other to show the distribution of timber. The collections are intended primarily to show the natural resources of the state of Kentucky. The museum has recently been removed from Frankfort to Lexington and is now being systematically arranged.

LOUISIANA

Louisiana state university and agricultural and mechanical college museum, Baton Rouge. The collections are distributed among the various departments and are in charge of the professors of each department.

Geology and mineralogy. Collections representative, classified and arranged.

Zoology. Several cabinets of mammals and birds; five large cabinets of shells; several hundred jars of invertebrates (all the types represented); a few dried specimens of invertebrates and a few skeletons; also many charts and drawings.

Entomology. 150 cases of insects principally southern.

Botany. Between 1500 and 2000 classified specimens and a great deal of material preserved in formalin and alcohol.

There has been recently established on the Gulf of Mexico, in Louisiana, a gulf biologic station through which the collections of this institution will be greatly increased.

Tulane university of Louisiana, Tulane museum, New Orleans. George E. Beyer, *curator and professor of biology and natural history.*

Paleontology. 3000 fossils and casts of fossils, of general distribution. The entire department is in course of reconstruction just at present.

Mineralogy. 5000 specimens: one of the largest collections in the south, representing between 400 and 500 species and varieties.

Historic geology. 300 specimens: a general stratigraphic series, illustrating rocks of the various formations and periods from the Archaean to the Quaternary; and a special series illustrating the geology of New York.

Zoology. Collections illustrate all classes and nearly all orders, those in mammalogy, ornithology, herpetology, ichthyology and conchology being extensive and specially representative of Louisiana and the southern states. Invertebrate zoology is fairly well represented, and is particularly complete in Mollusca.

There is a very good collection of glass models, made by Blaschka. Osteologic collections include complete and partial skeletons, skulls, sternums, etc.

Botany. 45,000 specimens: herbariums of Dr Josiah Hale; Prof. John Riddell; W. M. Carpenter; Herman Curtins; F. Laskar's herbarium of about 300 European medicinal plants, and Prof. T. G. Richardson's collection of cryptogams, consisting principally of Filices from South America.

Ethnology. Collection small, with the exception of the American section. There are two Egyptian mummies, with cases and wrappings, one of which is the remains of Got-Thoti-Auk, an official of high rank under Osorkon 2. The American section contains chiefly skeletons, skulls, implements and pottery of the aborigines. Mound investigations have been carried on by the curator during the last three years. Much valuable material has been accumulated. Many duplicates for exchange which may be obtained on application.

MAINE

Bates college museum, Lewiston. Arthur L. Clark; *professor of physics.*

Collections limited but representative and increasing yearly. Minerals and Carboniferous plants most prominent among the geologic material.

Bowdoin college, Brunswick. No report.

Colby college museum, Waterville. W. S. Bayley in charge.

Paleontology. 1500 specimens: general, arranged to illustrate lectures on historic geology.

Mineralogy. 3000 specimens: general.

Lithology. Exhibits: the Rosenbusch collection of typical rocks; building stones of Maine; American type specimens of rocks; also the Maine state geologic collection, embracing specimens obtained from C. T. Jackson during the first survey of the state in 1837-39.

Zoology. 500 specimens: a few mounted skeletons, and a number of alcoholic specimens.

Botany. 800 mounted specimens illustrating partially the flora of the state.

Ethnology. A set of Ward's collection of masks of Indians of the Pacific coast.

Kennebec historical society, Hall Lithgow library building, Augusta. Elizabeth M. Le Prohon, *secretary*.

Some small collections in natural history, prominent among which is a general collection of minerals.

University of Maine museum, Orono. Gilman A. Drew, *professor of biology*, in charge.

Paleontology. 1000 specimens arranged to illustrate briefly the fauna and flora of all geologic periods.

Mineralogy. 600 specimens: a general collection of 500 specimens, and a good representation of Maine minerals; an economic collection of 300 specimens.

Geology. A series of specimens illustrative of stratification and other characteristics of sedimentary rocks.

Lithology. 300 specimens.

Zoology. 2500 specimens: leading forms of both vertebrates and invertebrates of Maine; enough exotic forms for illustration of types. Material for exchange.

Botany. 15,000 specimens: the Halsted collection of New England lichens; the Cummings and Seymour collection of lichens; Cook's illustrative collection of fungi; the Ellis and Evehad collection of fungi; the Underwood collection of liverworts; the Sullivan and Lesquereaux collection of mosses; the Blake herbarium of 10,000 specimens of cryptogams and phanerogams; a special herbarium of phanerogams and cryptogams of Maine; the Halsted collection of weeds and the Harvey collection of weeds and forage plants of Maine.

Ethnology. 150 specimens gathered in Maine.

The museum is giving special attention to its collection from Maine, particularly the mammals.

MARYLAND

Johns Hopkins university, Baltimore. William Bullock Clark, *professor of geology*, assisted by Harry F. Reid, *professor of geologic physics*; Edward B. Mathews, *associate professor in mineralogy and petrography*; George B. Shattuck, *associate professor of physiographic geology*.

The paleontologic and geologic collections are described in the university publication, *Retrospect of 20 years, 1876-1896*, as follows.

The collections of the geological department consist primarily of a large amount of material brought together from Maryland and adjacent states of Virginia, Pennsylvania, Delaware and New Jersey, and include representatives of most of the important rock types, fossils and minerals from the several formations of this territory. The collections are especially rich in crystalline rocks and in Cretaceous and Tertiary fossils. Some of this material has already been described, while much awaits further study. In addition to the large amount of material thus brought together from the surrounding region, the following special collections form a portion of the university's possessions:

The Williams collection contains several thousand objects, consisting of extensive suites of specimens and of thin sections of minerals and rocks from the best known and most thoroughly studied localities in both Europe and America. They have recently been presented to the university by Mrs Williams.

The Lewis collections of rocks and thin sections, numbering over 1000 specimens, have been deposited with the university by Mrs Lewis. These specimens were collected by the late Prof. H. Carvill Lewis, and include carefully selected materials, especially from Pennsylvania, Germany, Switzerland and South Africa.

The Krantz collection of fossils contains several thousand specimens from the best known localities in Europe, being representative of all the different horizons.

The Hill collection contains a large number of specimens of rocks and characteristic fossils from the Cretaceous formations of Texas, collected by Prof. R. T. Hill, of the United States geological survey. It was presented to the university by Messrs Jesse Tyson, Francis White, Mendes Cohn, W. T. Dixon and D. C. Gilman.

The Stürtz collection comprises a suite of over 400 hand specimens and accompanying thin sections. These represent the rocks

cited by Prof. Rosenbusch in his *Mikroskopische physiographie* and are from the type localities.

The Lehmann collection, a suite of specimens and thin sections gathered by Prof. J. Lehmann, was sent by him to the university to illustrate his well known work on the crystalline schists.

The Allen collection of minerals, which is especially rich in early discoveries from American localities, includes many of the type specimens illustrating the papers of Prof. O. D. Allen, late of Yale university.

There are also private collections made by Prof. Clark and others of the department; also numerous small collections acquired by gift, exchange or purchase, among others from the United States national museum, the national surveys of Russia and Canada, the universities of Berlin, Göttingen, Harvard, Yale, Chicago, Iowa, Michigan, Alabama, etc., as well as from individuals in this country and in Europe.

Apparatus. Among the models are the following:

- 1 A set including Europe, Asia, Africa, North America, South America, United States and Pennsylvania, placed in the custody of the university by E. H. Butler & Co. of Philadelphia.

- 2 A large relief of the state of Maryland on the scale of 2 miles to an inch prepared for the World's Columbian exposition and deposited by the state geological survey.

- 3 A model of Baltimore and vicinity on the scale of 4 inches to the mile without vertical exaggeration, all of the above being the work of Cosmos Mendeleeff of Washington.

- 4 The Shaler and Davis models illustrating the development of topographic form and geologic structure.

- 5 The Heim models showing the structure of volcanic cones, glaciers, Alpine valleys and coast lines.

- 6 Models illustrating the development of the Ammonites and the different types of Foraminifera.

- 7 Several hundred models illustrating different phases of geology, paleontology and mineralogy.

In addition to the above there are several hundred lantern slides and photographs.

Library. The library in geology is very large and rapidly increasing. It contains over 6000 bound volumes and 10,000 unbound volumes and pamphlets, among them the libraries of the late Professors Williams and Lewis and the meteorologic library of Prof. Cleveland Abbe, besides several large collections of books recently purchased by friends of the university. The library is particularly rich in books of reference, containing full sets of most of the important journals as well as the publications of foreign official surveys and museums. The books cover the fields of general geology, paleontology, petrography, economic geology and mining.

Maps. Extensive suites of maps, and among them, these:

1 A set of topographical and geological maps prepared by the United States geological survey; maps prepared by the United States coast and geodetic survey, Mississippi and Missouri river commissions, United States land office, and many of the earlier national surveys.

2 Maps prepared by the various state geological and topographical surveys in the United States.

3 Partial, and in some cases complete, sets of topographical and geological maps prepared by the national surveys of Great Britain, including many of the colonies (especially Canada and Australia), France, Germany, Austria, Russia, Norway and Sweden, Italy, Holland, Belgium and Japan.

The botanic collections are described in the same publication as follows:

1 The Schimper collection of European and African flowering plants, of about 4300 sheets, the gift of Dr A. F. W. Schimper, now professor of botany in Bonn;

2 The Fitzgerald collection of American and European mosses, including about 1000 sheets, the gift of Mr Charles H. Fitzgerald, formerly of Baltimore.

Deposited with the university and available for use in its work are:

3 The local collection of flowering plants and ferns belonging to the Naturalist's field club, of about 1400 sheets;

4 The collection of American cryptogams, chiefly algae and fungi, belonging to Dr J. E. Humphrey, comprising about 2500 sheets.

Accessible to suitably prepared students, is the remarkable herbarium of Capt. John Donnell Smith of Baltimore, representing the flowering plants and ferns of many parts of the world, especially rich in the flora of tropical America, including some 85,000 sheets. The owner of this collection has generously offered to give it to the Johns Hopkins university when a suitable place can be provided for it.

Maryland academy of sciences, Baltimore. P. R. Uhler, *president*; William Wollé, *curator*; John Widgeon, *collector*.

Paleontology. 500,000 specimens nearly all from Maryland localities, from all formations in the state; Lower Helderberg and Oriskany exceptionally well represented. Triassic dinosaurian tracks; Jurassic and Lower Cretaceous plants.

Historic and economic geology and lithology. A few hundred specimens. Gneisses, granites, diorites, marbles, sandstones

and clays; geodes, stellate masses of selenite, large crystals, models, diagrams, photographs, etc.

Photographs for exchange.

Mineralogy. 5000 specimens. Over 2000 species from European and American localities. The Dr F. E. Chatard, the Dr Riley and the Dr E. A. Dalrymple collections. Many rare forms from the Bare Hills, Jones Falls, Mineral Hill, the Blue Ridge mountains and other Maryland localities.

Zoology. Many thousands of specimens representing the whole fauna of Maryland. A large series of mounted birds and mammals, reptiles and fishes are exhibited. The birds of Maryland are mounted in separate upright cases showing changes of plumage, with young, nests and eggs, etc. A very extensive collection of insects of all orders from all parts of Maryland.

There is a general collection of shells, specially rich in Unios.

Botany. A nearly complete collection of the plants of the state representing about 1500 species, 500 of which are fungi.

Ethnology. 10,000 specimens mostly Indian relics from Maryland.

Maryland geological survey, Baltimore. William Bullock Clark, *state geologist*.

Paleontology. Collection at present incomplete, but arranged to illustrate the Paleozoic, Mesozoic and Tertiary formations of Maryland.

Mineralogy. Preliminary and incomplete collection illustrating a large variety of species.

Historic geology. Collections incomplete but containing a large amount of material from the Devonian, Carboniferous, Eocene, Miocene and Pleistocene formations. A systematic collection consisting of fossils, rocks, ores, etc., representing all geologic formations, from Maryland localities, is exhibited in cases in the entrance hall of the Administration building.

Economic geology. Part of the collections are exhibited in two rooms on the ground floor of the Administration building. One room is devoted to stone and contains 60 dressed and polished cubes 8 x 8 x 8 inches of building stones from Maryland quarries,

4 polished granite risers 7 feet by 1 foot 6 inches and 4 large turned columns of granite, marble, serpentine and red sandstone, a collection of polished slabs of ornamental marbles 8 x 4 and 4 x 4 inches and slabs of polished marble and serpentine 40 x 30 inches. There are also other columns and blocks of granite, serpentine, etc. The Triassic breccia, known as the Potomac marble, from Frederick county is represented by a large polished column, slabs, blocks and partially polished boulders, and the slate of Hartford county by a series of specimens of rough blocks, split and finished slates. Samples of road-making rocks are shown with the results of tests to which they are subjected. A series of tested specimens from all available quarries in the state are kept in storage.

The other room contains principally clays and clay products. A series of clays from all the principal producing localities is kept, a typical collection being exhibited in glass jars. Pottery is well represented from most of the Maryland producers, terra cotta is shown in ornamental pieces and such blocks as are commonly used in building construction; gas retorts, furnace blocks, fire brick, stove lining and glazed bricks show the uses of fire clay, pressed brick are shown in the construction of an ornamental mantel and in panels. There is also a series of sands, ground quartz, talc, etc., shown in jars and a set of the most typical soils of the state are shown in bulk and divided into their component parts of gravel, sand, silt, clay, etc.

There is a reserve series of coal specimens kept in jars and the results of their analyses. The series of coals on exhibition consists of large cubes representing the principal coal seams of the state. Relief and geological maps and transparencies occupy the windows and wall space.

There is a geologic library of over 1000 volumes consisting largely of official reports of the national and state surveys.

Rock Hill college museum, Ellicott City. The Rev. Bro. Fabrician F. S. C. in charge.

Mineralogy. 2000 specimens for educational purposes. Used specially in connection with the study of chemistry.

Historic and economic geology. 50 specimens from the various rock formations in the vicinity of Ellicott City.

Botany. 2500 specimens including the herbarium of Prof. W. E. H. Aikin; a set of carices from Dr H. P. Sartwell of Penn Yan N. Y. and a complete set of the ferns of Howard county, Md.

Ethnology and anthropology. 800 specimens including a rare lot of specimens from Ceylon consisting of native manuscripts, photographs, coins, idols, musical instruments, trinkets, etc. Also many plaster casts of American Indian relics.

Western Maryland college, Westminster. No report.

Woman's college museum, Baltimore. Arthur Bibbins, *director*.

Paleontology. 10,000 specimens consisting of a general systematic collection of fossil animals and plants; a collection to illustrate historical geology on exhibition and a similar series for students use and a collection of miscellaneous material for determination by students. The collections are particularly rich in fossil plants from the Potomac group of Maryland and include among other types *Cycadeoidea bibbinsi*, *clarkiana*, *fisherae*, *fontaineana*, *goucheriana*, *mcgeeana*, and *uhleri*, all of Ward; *Cupressanoxylon bibbinsi* Knowlton, and many others. Also the type skulls of *Cetatherium crassangulum* and *Metopocetus durinasus*, of Cope.

There are also some interesting Dinosaurian remains from Maryland localities.

Some Potomac *Cycadeoidea* and Miocene fossils for exchange.

Mineralogy. 20,000 specimens. A general exhibition series and a students series. The collection is specially rich in minerals from the vicinity of Baltimore.

Much material for exchange.

Economic geology. 5000. There is a large collection of iron ores from European and other localities as well as complete series from the once extensively worked mines of limonite and siderite of Maryland; also collections of tin, copper, zinc, lead, manganese, chrome and other ores.

Lithology. 5000 specimens. Series of clays, etc., representing the lithology of the Potomac group. Crystalline schists and igneous rocks of the Piedmont highlands of Maryland. United States geological survey educational series, etc.

Gabbro, gabbro diorite, Websterite, Iherzolite, etc., described by Williams from Baltimore county for exchange.

Zoology. 20,000 specimens. General systematic series; collections of mounted and unmounted mammals and birds; a large collection of North American birds eggs, collections of mollusks, echinoderms and coelenterates, and a large collection of American and foreign lepidoptera.

Botany. 25,000 specimens, including the Edward Rowland, the Lotzy, the Humphrey and the Metcalf herbariums.

Ethnology and anthropology. 3000 specimens of American Indian remains from many localities. The local collections are very extensive. There is also a good lot of Egyptian and Babylonian material and a fine series of Mexican objects, including a series of casts of heads of native Mexicans.

The museum also contains sections of fine arts and collections of numismatics, archeologic and historic objects. The philosophical society holding monthly gatherings is under its auspices. Series of public lectures are given during the winter.

MASSACHUSETTS

Amherst college, Amherst. 1 WOODS CABINET. B. K. Emerson in charge.

Paleontology. 20,000 specimens, constituting a good general representation of the American formations, and best representing the Triassic of the Connecticut valley. There is also an exceptionally full series of vertebrate fossils from the southern Pleistocene formations; a general collection of foreign material; and a unique series of Carboniferous fishes from Scotland. Considerable material for exchange.

Mineralogy. The Shepard mineralogic collection includes 10,000 specimens of a general nature, while the collections of rutile from Massachusetts and the southern Appalachian region,

tourmalin from Paris Me., and the collection of gems, are particularly complete. The Shepard meteorite collection includes 118 aerosiderites and 180 aerolites. Material for exchange.

Lithology. 2000 specimens chiefly illustrating concretionary formations and metamorphism. A large collection in general lithology with many thin sections. Large collections illustrating the early geologic surveys of the New England states, Vermont by Prof. C. B. Adams, Connecticut by Prof. C. U. Shepard, Massachusetts by Pres. E. Hitchcock which have great historical value.

2 APPLETON CABINET. The Hitchcock ichnologic collection contains more than 20,000 specimens of reptilian tracks found in the sandstone of the Triassic formation.

Zoology. The Adams collection of shells comprising 15,000 specimens of 1200 species and a good general collection for illustration of zoology.

Botany. 4000 specimens; phanerogams, cryptogams, and other forms of lower vegetable life.

Ethnology and archeology. 1500 specimens: the Gilbert museum, a collection of stone relics of the American Indians found within 50 miles of Amherst college; 500 specimens of bas-reliefs, cylinders, coins, and seals from Nineveh and Babylon. Large slabs from Nineveh also line the walls of the entrance hall of the library.

Boston society of natural history, Boston. Museum staff: W. O. Crosby, *assistant in mineralogy and geology*; Miss M. E. Carter, *assistant in botany*; Miss L. R. Martin, Mrs J. M. A. Sheldon, Miss E. B. Bryant, *museum assistants*.

Paleontology. 22,847 specimens: the Eser general collection from south Germany of 8809 specimens, including a number of Oppel's and Heer's and one of Meyer's types; 4810 specimens of European species; 8478 specimens of American forms, including a few types; and a collection of New England fossils numbering 750 including type specimens of trilobites from Braintree Mass.

Mineralogy. 5000 specimens: representing the various groups somewhat uniformly; a special collection of 1000 New England minerals.

Geology. 4000 specimens, most fully representing the divisions of dynamic geology and petrography (lithology and petrology); historic geology not prominent.

Zoology. 120,000 specimens: mounted mammals, 118; mounted birds, 12,328, including the Lafresnaye collection, containing more than five hundred types; Samuel Cabot's collection with his types, and the Bryant collection named by Ridgway; 5000 unmounted bird skins, and 5200 birds eggs; 1000 mounted specimens received from the Boston museum and including a large part of the collection formerly in Peale's museum in Philadelphia. Among these are a number of Wilson's and Bonaparte's types and specimens figured in their works on American ornithology, also a number of specimens from both the Lewis and Clark's and Long's expeditions; reptiles, 817; amphibians, 424; fishes, 4500; mollusks 35,000, including many of the type specimens described by Gould, Bland and Binney, Achatinellae described by Gulick, and Strophias described by Maynard; crustaceans, 2500; insects 50,000, including the Harris collection, some specimens of which were named by Thomas Say, and the Burnett collection; including a number of type specimens of parasites; worms, 800; echinoderms, 1700; coelenterates, 1000; and sponges, 1475.

The Wyman anatomic collection contains many of Dr Wyman's type specimens.

Botany. 85,280 specimens: the John A. Lowell herbarium of 17,780 specimens; the C. J. Sprague collection of 2550 North American lichens; part of the Cummings, Williams and Seymour collection, 250; the Seymour and Earle collection of 450 specimens of economic fungi; a special New England collection of 4750, and the society's general herbarium of 39,500 specimens; preparations and originals from the microscopic collections of Bailey, Glenn, Greenleaf, Habirstraw, Burnett and Wyman.

Ethnology. Collections have been given to the Peabody museum of archeology and ethnology in Cambridge.

The plan of the museum has been limited in order that its growth might not interfere with the prosperity of the society and its most important function, the publication of original re-

searches. The departments of mineralogy, geology, synoptic botany and zoology and paleontology are preceded by an explanatory department giving illustrations of the principles of dynamic geology and biology. Each of these is limited in its scope, so far as exhibition is concerned, so as to teach as far as practicable, the evolution of typical structures and forms. These together form the educational series. Above these are placed the systematic collections in exactly the same order, the principle being that each department in its public exposition shall be a lesson in evolution founded on the available gradations of forms, and the whole series of departments repeat and enforce this proposition. The birds are not included in this arrangement. They have been placed on exhibition in accordance with old-fashioned standards. There is now also a New England collection in each department. These will be eventually collected into one grand series to form a New England museum which, it is hoped, will not be limited in its scope, but will strive to give a complete presentation of the natural history of New England.

Cape Ann scientific and literary association, Gloucester. Thomas Conant, *president*.

Mineralogy. 1000 specimens.

Zoology. 500 specimens: fishes and marine invertebrates found off Cape Ann.

Conchology. 200 specimens.

Botany. 200 specimens: ferns and grasses.

Ethnology. A few Indian implements found in Essex county, Mass.

City library association, natural history museum, Springfield. William Orr, *curator*; Grace L. Pettis, *assistant curator*.

Paleontology. 500 specimens: general, the Upper and Lower Silurian, Carboniferous and Triassic formations being best represented.

Mineralogy. 1300 specimens: representing all important species; 346 specimens of local minerals.

Lithology. 175 specimens of local rocks.

Historic geology. Specimens from the Triassic sandstone of the Connecticut valley showing fossil footprints.

Dynamic geology. 650 specimens.

Zoology. 4200 specimens: a series of mammals; a series of mounted birds, 12 bird groups, three mammal groups and a collection of the eggs of local birds; a few skeletons; a series of fishes; a series of corals, and collections of shells and of local insects.

Botany. A series of North American woods; woods of Nassau and California; an exhibit of Indian corn, and one of vegetable fibers. Herbarium, 1014 sheets.

Ethnology. 2000 specimens: Mexican curios; local relics of the American Indian; Russian and Scandinavian material; casts of some prehistoric implements; some relics of the colonial and revolutionary wars.

Clark hall and Thompson biological laboratory, Williams college, Williamstown. H. F. Cleland, *instructor in geology and botany*, in charge of Clark hall, and S. F. Clarke, *professor of natural history*, in charge of the biologic laboratory.

Paleontology. 3000 specimens: fair representation of all formations, augmented by Emmons's valuable type specimens from the Triassic strata of North Carolina.

Mineralogy. 1250 specimens: general, best representing calcite, augite, hornblende and scapolite.

Historic geology and lithology. A petrographic collection of 500 specimens; a series of 250 illustrating structural geology; material from the local geology about Williamstown.

Zoology. 1000 specimens of mollusks in Clark hall; many forms of mammals, birds, fishes, and invertebrates, Jackson Hall.

Botany. Three or four separate herbariums of importance; minor collections of Hepaticae and Musci.

Ethnology and archeology. A cast of the Rosetta stone; three Assyrian slabs obtained by Rawlinson and Layard; several Babylonian blocks with cuneiform inscriptions; Central American sculpture and sundry articles collected by missionaries; local antiquities relating to the French and Indian wars.

College of Holy Cross, Worcester. No report.

Harvard university museum, Cambridge. Alexander Agassiz, *director*; Nathaniel Southgate Shaler, *professor of geology*; William Morris Davis, *Sturgis professor of geology*; John Eliot Wolff, *professor of petrography and mineralogy*, curator of mineralogy; Charles Palache, *assistant professor of mineralogy*; George Lincoln Goodale, *professor of natural history*; William Gibson Farrow, *professor of cryptogamic botany*; Benjamin Lincoln Robinson, *Asa Gray professor of botany*.

Geology. The geologic collections illustrate dynamic, historical and other branches of geology, physiography and geography, etc. There are three rooms provided for exhibitions but aside from a large model by Curtis of the Boston metropolitan district there are as yet no exhibits in these rooms.

Mineralogy. The collection was founded in 1793 and is the oldest natural history collection in the university and probably the oldest public collection of minerals in America. The public collection is exhibited on two floors of the mineralogic section of the museum in flat floor cases and vertical cases arranged against the walls.

The lower or main floor contains the systematic collection arranged according to Dana's system, including about 10,000 specimens with the special collections arranged in the upper floor or gallery. The latter include a collection of 600 agates, partly cut and polished, collections illustrating the physical characters of minerals, and will ultimately include a small collection of rocks. In the gallery is the Hamlin collection of tourmalins, from Paris Me., the largest in existence. The collection of meteorites includes examples of 291 falls with a total weight of 2700 pounds; in 24 falls the museum has the largest amount of that fall. In the laboratories and workrooms connected with the museum are duplicates, specimens used for teaching etc., which bring the total mineral specimens worth enumerating to about 25,000; there are also a great many thousand specimens of rocks, with thin sections. The mineralogic museum includes a large number of rooms amply equipped for

research and teaching, including a chemical laboratory, workshop equipped with power, room for work with optical instruments, drawing room and laboratories for students.

Comparative zoology. The exhibition space in the synoptic department is divided into a series of rooms, 30x40 feet, devoted to systematic collections of typical animals, represented by mounted skins, skeletons, alcoholic and other preparations, with the object of showing the natural relationship of one class of animals with another. There are also collections to illustrate geographic distribution and rooms devoted to faunal collections of Europe, South America, etc., and to the faunal regions of the Atlantic and Pacific oceans.

The bulk of the collections are stored in trays or drawers systematically arranged so as to afford easy reference and associated with such books and facilities as may be needed for their study.

There is no information obtainable as to the extent of the collections in this museum.

Botany. The Botanical collections comprise (1) the Gray Herbarium, containing more than three hundred thousand sheets of mounted specimens. (2) the Cryptogamic Herbarium, and cases for the display of selected specimens to illustrate the principal groups of algae, fungi and lichens. (3) the Economic Museum, having, besides the material for investigation and comparison, exhibition cases filled with specimens illustrating the useful plants and their products. (4) the Ware Collection of Blaschka Glass Models of Plants and Flowers, now containing about seven hundred complete specimens of plants in flower, together with about thirty five hundred analytical details. (5) the Paleontological collection. (6) the Botanic Garden and its Greenhouses, together with Botanical Laboratories and a Lecture-room. (7) Botanical Laboratories and Lecture-rooms in the University Museum Building.

PEABODY MUSEUM OF AMERICAN ARCHEOLOGY AND ETHNOLOGY, Harvard university. Frederic Ward Putnam, *curator and Peabody professor of American archeology and ethnology*; Charles C.

Willoughby, *assistant curator*; Alice C. Fletcher, *assistant in ethnology*; Zelia Nuttall, *honorary assistant in Mexican archeology*; George Byron Gordon, *assistant in Central American archeology*; Jane Smith, *assistant librarian*; Frances H. Mead, *assistant and secretary*; Frank Russell, James H. Woods and Roland B. Dixon, *instructors in anthropology*.

The arrangement of the collections is intended to facilitate research in general anthropology, with special reference to American and comparative archeology and ethnology. The upper hall and one of the galleries are given to the Hemenway collection of archeology and ethnology of the southwestern tribes. The collections of American archeology are specially important and extensive from Peru, Colombia, Central America and Mexico, southwestern United States, the Ohio, St Johns and Delaware valleys, New England and the Pacific coast. The museum contains also archeologic collections from the French gravels and caves, from Denmark, from the Swiss lakes, and from many other regions; ethnologic collections from various parts of the world; and an important collection of human craniums and skeletons. These collections furnish the means for making direct comparisons between the art and culture of various peoples.

The regular publications of the museum are annual reports, special papers and memoirs.

SEMITIC MUSEUM, Harvard university. David Gordon Lyon, *curator*.

The Assyrian room contains casts of large collections of Assyrian, Babylonian and Hittite bas-reliefs; stone and clay tablets written in cuneiform; cylinder seals and other objects in bronze, clay and stone of Babylonian-Assyrian origin. The Palestinian room contains collections of stone inscriptions, manuscripts, coins, pottery, glass vases, bronzes, bas-reliefs, sarcophagi, etc., and photographs and collections illustrating the geology, botany and zoology of Palestine. The museum was founded by Jacob H. Schiff and was designed as the home of Semitic instruction. The library, lecture rooms, students and curators are also in the building on Divinity avenue.

Leominster public museum, Leominster. E. G. Davis, *curator*.

Paleontology. 50 specimens: fossils from various formations.

Mineralogy. 700 specimens: some interesting quartz crystals; ores and chalcedony from Colorado.

Lithology. Specimens of local granites, schists and slates.

Economic geology. Building stones, ores of precious metals, clays and grits.

Historic geology. A series of specimens and photographs illustrating the effects of the glacial period on topography.

Zoology. 200 specimens: a series of the local mammals and birds; a collection of marine shells.

Botany. 710 specimens, illustrating the local flora, ferns of Ceylon, and algae.

Massachusetts agricultural college, Amherst. R. S. Lull, *curator of museum of zoology*; G. E. Stone, *in charge of botanic museum*; H. T. Fernald, *in charge of entomologic collection*; S. F. Howard, *in charge of mineralogic collection*; J. B. Paige, *in charge of veterinary museum*.

Paleontology. About 300 specimens consisting of a small collection of invertebrate fossils for illustration in geological instruction.

Mineralogy. About 225 minerals representing groups designated by Dana and duplicates for use in determinative mineralogy.

Historic and economic geology and lithology. Soils and rocks of the state collected by Edward Hitchcock and catalogued in the *Report on the agriculture of Massachusetts* for 1858. Of the 2900 specimens which passed through a fire in 1885, 2600 have been identified and classified by Dr E. R. Flint.

Zoology. 9000 specimens consisting of a representative collection of invertebrates (not including insects) and a series of mounted mammals, birds, reptiles, amphibians and fishes, both skins and skeletons, besides numerous alcoholic specimens of the three lower classes.

Entomology. 30,000 specimens including all orders of insects and such other terrestrial arthropods as are of economic im-

portance. Under certain conditions exchanges are sometimes made.

The private collection of Prof. C. H. Fernald consists mainly of Microlepidoptera comprising nearly all of the described species of the family Pterophoridae of North America and Europe and many from South America; all the types of Fitch except one which is not in existence; all the types of Fish as well as his own types and cotypes of nearly all of the species described by Lord Walsingham from North America. It includes about nine tenths of all the types of the described species of North America belonging to this family.

Of the Tineina it contains a large number of authentically named species of North and South America together with all of his own types, a large number of those of Chambers and Miss Murtfeldt and cotypes of most of the species described from North America by Lord Walsingham.

Of the Pyralidae it contains authentic specimens of nearly all the described North American species, and many from Mexico, Central America, the West Indies, South America, Europe and other parts of the world; all of his own types and many cotypes of Hulst and Grote. This collection is rendered more valuable from the fact that the owner has compared it with all the collections in all the American and European museums containing types of North American species and critically compared and marked as homotypes such as were thus proved to be exactly like the types.

The number of species of the family Tortricidae in this collection is larger than that of any other collection in existence, being about twice as large as that of the British Museum and three times as large as that of the Berlin or Vienna museums with which it has been compared. It contains a very large number of types and cotypes as well as homotypes having been compared by the owner with nearly all of the Tortricid types in existence.

Botany. This collection consists of a herbarium in which all classes of plants are represented except the algae. It also contains sections of most of our Massachusetts woods, many forms

of natural and artificial grafts and the results of interesting physiologic experiments conducted by Pres. Clark, a collection of economic seeds, considerable miscellaneous material and some material of horticultural value such as models of fruits, etc.

The herbarium includes about 15,000 species of flowering plants and about 10,000 species of cryptogams, the latter represented by mosses, lichens and fungi.

The only specimens for exchange are the few duplicates of English mosses collected by Baker.

Ethnology and anthropology. Small collection of about 200 specimens of Ainu relics from Sapporo, Island of Yezo, Japan; 50 specimens: Egyptian material, Mexican pottery, and relics of the American Indians; an interesting collection of books, pamphlets, and manuscripts, and various relics, connected with the domestic life and industries of the early settlers of the town.

This museum is connected with the public library, both of which were established and built by popular subscription for the purpose of preserving historic matter and relics of olden times. It is therefore almost exclusively of local interest, with little, if anything, for general exchange.

Massachusetts institute of technology, Boston. William H. Niles, *professor emeritus of geology*; William O. Crosby, *associate professor of structural and economic geology*; George H. Barton, *assistant professor of geology*; Charles H. Warren, *instructor in geology*.

Paleontology. 10,000 specimens.

Mineralogy. 10,000 specimens.

Economic geology and petrography. 8000 specimens.

Structural geology. 2000 specimens.

Peabody academy of science, East India Marine hall and an addition, Salem. Founded in 1867 by George Peabody of London "for the promotion of science and useful knowledge in the county of Essex." George Augustus Peabody, *president*; Abner C. Goodell, *secretary of trustees*; John Robinson, *treasurer*;

Edward S. Morse, *director*; John H. Sears, *curator of mineralogy and geology*; Lawrence W. Jenkins, *curator of ethnology*.

Paleontology. Small synoptic exhibit of specimens illustrating the historic geology of the earth, from the oldest to the most recent formations.

Mineralogy. A complete exhibit of the minerals of Essex county (450 specimens); also 960 specimens, illustrating the school edition of Dana's *Mineralogy*.

Historic geology and lithology. A general collection of 2000 specimens illustrating historic geology; 725, illustrating the historic geology of Essex county; microscopic sections illustrating the petrography and photographs of geologic features of Essex county.

Geology. A synoptic collection illustrating the historic geology from the oldest to the most recent formations; a very full collection of the rocks of Essex county; thin sections for microscopic study, illustrating the petrography, and photographs of geologic features of Essex county.

Zoology. Nearly complete series filling 150 running feet of wall cases, of the animals of Essex county; a synoptic collection illustrating the animal kingdom from the lowest to the highest forms, arranged and labeled according to textbooks commonly used in schools and colleges of the state.

Botany. A herbarium of 4000 sheets of the plants of Essex county; a large collection of woods of the county; a general collection illustrating the vegetable kingdom and a general reference herbarium.

Archeology. A large collection of the prehistoric relics of Essex county; smaller collections representing other parts of the United States, European countries and Egypt.

Ethnology. A collection arranged by countries, illustrating the costumes, customs, implements of war and of domestic use, and objects of art of the native races of China, Japan, India, Malay archipelago, Siam, Korea, Africa, the islands of the Pacific, North and South America, etc.

This museum contains the collections of the East India Marine Society, founded in 1799, and has had an uninterrupted existence since that date.

One of the objects of the society was to form a museum of natural and artificial curiosities. The museum was begun at this time by the donation of the extensive private collection of Capt. Jonathan Carnes. Owing to the unusual facilities enjoyed by the earlier members of the society some of the results now attained are the Korean collection, one of the most important in the country; the Japanese collection, which is by far the largest in the world; and important collections of ethnologic material from the South Sea islands.

The museum is also rich in local material. The collections in botany, zoology and mineralogy of Essex county being very complete.

Since 1867 large additions have been received from the Essex institute and through the trustees and director of the academy.

There is also in the museum a historical collection of portraits of prominent Salem merchants, members and officers of the East India marine society, together with many interesting relics connected with the early history of that institution, and models and pictures of Salem merchant vessels, a suggestive memorial of the commercial history of the city.

Smith college museum, Northampton. Harris H. Wilder in charge.

The collections are small but increasing along the lines most necessary for teaching purposes. There are a few cases of typical minerals and fossils and a few hundred specimens in botany and zoology. The aim is to arrange specimens to illustrate lectures, each important class of animals is represented by a few selected specimens, as for instance, a skeleton and other anatomic preparations.

Worcester natural history society, 12 State st., Worcester. Bessie L. Dewhurst, *custodian of the collections*; Herbert D. Braman, *superintendent of the cabinet*.

Paleontology. 500 specimens: Vertebrata, 150; Articulata, 50; Mollusca, 250; Radiata, 300; and Protozoa, 50.

Mineralogy. 3000 specimens: 2700 specimens of wide distribution; 300 illustrating the minerals of Worcester county.

Historic geology and lithology. 3500 specimens: alluvial and diluvial material; the Eocene, Miocene, Pliocene and Carboniferous formations; chalk, greensand, oolite, red sandstone, coal, limestone, clay slate, mica slate, gneiss and eruptive rocks; rocks of Worcester county.

Zoology. 15,000 specimens: mammals, 630; birds, 400, 300 nests and eggs; reptiles, 165; fishes, 70; insects, 2000; crustaceans, 75; and 8000 lower invertebrates.

Botany. 1500 specimens: miscellaneous herbarium illustrating the flora of North America and of England; and a herbarium of Worcester county flora.

Collections specially illustrative of Worcester county.

Any of the specimens are lent for private study, and to the Worcester public schools for illustration of natural history lessons. Classes in various branches of natural history, both for adults and children, are conducted yearly.

MICHIGAN

Albion college, Albion. No report.

Alma college, Francis L. Hood memorial museum, Alma. E. H. Harper, *professor of biology, curator*, with one assistant, who is usually a student.

Paleontology. 2500 specimens: the Shroyer-Wilcox collection of 1000 species from the Cincinnati group; large general collection; two or three hundred species mainly corals from the drift and representing the various Lower Silurian types.

Mineralogy. 5000 specimens: silicates from Maine; lead and zinc ores from Joplin Mo.; and iron and copper ores from the upper peninsula of Michigan.

Historic and economic geology. 1000 specimens, illustrating the historic geology of the state; metamorphosis and degradation of rocks; building stones of the state; metals, their ores and products.

Zoology. 2500 specimens: Michigan mammals; birds of Michigan, with nests and eggs; birds of Florida, and a few species from Arizona; some alcoholic specimens of invertebrates; small

collection of tropical shells; and an incomplete series of Michigan shells. Local species for exchange.

Botany. 2000 specimens: local spermatophytes and pteridophytes; also some local forms of fungi and algae. Duplicates for exchange.

Ethnology. 200 stone implements of the American Indians.

Detroit museum of art (including the Detroit scientific association), Detroit. D. M. Ferry, *president*; George N. Brady, *vice-president*; Frederick E. Farnsworth, *secretary*; Collins B. Hubbard, *treasurer*; A. H. Griffith, *director*.

For list of collections, see Addenda, p. 222.

Hillsdale college, Hillsdale. No report.

Michigan college of mines, Houghton. A. E. Seaman, *professor of mineralogy and geology* in charge.

Paleontology. 1000 specimens for use in illustrating lectures; 3100 for use of students; a small type collection of living and fossil forms arranged zoologically in accordance with Nicholson's *New manual of paleontology*; 1000 fossils arranged zoologically and chronologically.

Mineralogy. 35,756 specimens: 151 crystal models in glass, 2153 crystal models in wood and plaster, 2260 natural crystals to illustrate crystallography; 485 specimens to illustrate physical and optical properties of minerals, pseudomorphs, etc.; a lecture exhibit of 10,000; 17,025 for use in laboratory work; an exhibition collection of 2550 specimens including the Emmer-son collection of 550; and 2132 microscope slides of minerals.

Lithology. 18,248 specimens: a lecture collection of 3800 rocks; a laboratory collection of 6500; a series of 1000 of the Rosenbusch typical rocks; 1975 specimens illustrating the formations of Michigan; and 4973 microscope slides of rocks.

Zoology. 800 specimens: chiefly invertebrates for use in instruction in classification, previous to work in paleontology.

Botany. 300 specimens of woods.

Ethnology. 250 specimens.

Michigan geological survey, Houghton. A. C. Lane, *state geologist* at Lansing, F. E. Wright at Houghton.

18,000 specimens: rocks gathered from different parts of the upper peninsula of Michigan by the survey corps, beginning with the administration of the late Charles E. Wright, in 1885, and augmented by the collections of private persons. The specimens previously collected by and under the different state geologists are now, in part, lodged in the University of Michigan at Ann Arbor. The collection of fossil corals made by former state geologist Rominger is at Ann Arbor, as is also considerable material from the lower peninsula collected by the late Dr Alexander Winchell, whose private collections are at Alma college.

Besides the collection of rocks, the survey possesses a small collection of copper and other ores and minerals from the vicinity of Houghton and a considerable number of suites representing deep drill holes in various parts of both peninsulas. These are in part at Lansing and in part at Houghton.

University of Michigan, Ann Arbor.

Historic geology and paleontology. 95,040 specimens, nearly all invertebrates: a large series from the geologic survey of the state, of which more than 100 are type specimens; the White collection of 1018 catalogue entries numbering 60,000 invertebrate fossils; the Rominger collection of 5000 species, 25,000 specimens, invertebrate fossils, which includes *a*) types of all Paleozoic corals described by Dr Rominger in the geologic report of Michigan, volume 3, *b*) stromatoporoids, *c*) bryozoans, *d*) Paleozoic fossils belonging to all other classes, *e*) a large number of European fossils of all ages and classes, the sponges of which form, with the American species, a very interesting series, and 250 species, 10,000 specimens of invertebrate fossils added by Dr Rominger; 40 Cretaceous and Tertiary fossils from Texas, specimens from Yellowstone park and 23 from the upper Missouri valley.

Mineralogy. 6000 specimens: the Lederer collection of 2500 minerals, principally European; rich series of Michigan minerals,

including all varieties of copper ores and associated minerals from the Lake Superior region.

Economic geology. A series of foreign and domestic building stones, deposited by the Smithsonian institution; a series illustrating the metalliferous regions of the upper peninsula of Michigan; 150 specimens of ores and rocks, deposited by the United States national museum; 39 of copper ore and associated rocks from the Wolverine copper mine; seven of native copper from the Calumet and Hecla mines; 25 of asphaltum and petroleum; samples of brine and salt from Percy's salt well, Mason county, Mich.

Physical geology and geography. A representative collection of volcanic products, including a series of specimens from Martinique and St Vincent; the deposit formed in caverns; chemical precipitates from lakes and springs; peat, lignite, coal, petroleum, asphalt etc.; meteorites, the products of rock weathering; soils etc. comprising several hundred specimens. Supplementing this collection and also used in illustrating lectures on physical geology and geography, are relief maps and models and a large number of lantern slides.

Zoology. A series illustrating the fauna of Michigan and other northern and western states; a collection of animals of the Pacific coast; many valuable specimens from the Philippine islands and other foreign countries; the Beal-Steere collection comprising numerous corals, shells, insects, birds and mammals from South America, China, Formosa, Philippines and the Moluccas.

Botany. 100,000 specimens representing 5000 species under 25,000 entries: large series of Michigan plants collected by the public surveys; several valuable herbariums and sets of plants, the most important of which are the Houghton herbarium, the Sager herbarium, the Ames herbarium, the Harrington herbarium, the Beal-Steere, the Adams-Jewett and the Garrigues collections; Collins's, Holden's and Setchell's *Phycotheca Boreali-Americana*; Briosi and Cavarra's *funghi parasiti*; Seymour and Earle's economic fungi, the continuation of Ellis's

North American fungi and large additions to the cryptogamic flora of Michigan.

Archeology and ethnology. Beal-Steere collection of arms, implements, carpenters tools, musical instruments and idols of the Chinese; many articles domestic and warlike used by North American Indians and natives of the south Pacific islands; clothing of the American Indians, modern Peruvians, Formosans and natives of the East Indies and Alaska; casts from Europe and the Ohio mounds and pottery from the Cliff Dwellers of New Mexico and Arizona received from the Smithsonian institution; the valuable collection made by the late Daniel De Pue, mostly from Washtenaw county, Mich.; a fine collection of flint instruments from Denmark and an extensive collection of Peruvian burial pottery secured by the Beal-Steere expedition.

The Frederick Stearns collection of musical instruments consists of 1400 pieces (no duplicates) representing nearly all types of instruments of all nations and ages, collected with reference to its educational value as illustrating the evolution of the modern types.

The Chinese exhibit of the New Orleans cotton exposition illustrative of the culture and manufacture of cotton and its use in garments, native-made household furniture, and house and garden pottery.

MINNESOTA

Carleton college, Northfield. L. W. Chaney, *professor of biology*, in charge.

Paleontology. 12,000 specimens: Cambrian, Silurian and Coal Measures.

Mineralogy. 2000 specimens.

Zoology. 1000 specimens: for class use only.

Gustavus Adolphus college, St Peter. J. A. Edquist, *curator*, in charge.

Paleontology. 1000 specimens: general collection of 300 Silurian and Carboniferous; special collection representing Cretaceous and Jurassic flora and fauna of Laramie plains, Wyoming; left femur of Brontosaurus, 75 inches in length. Some material for exchange.

Mineralogy. 800 specimens: Smithsonian collection from different localities representing all the groups; general collection of carbonate minerals and ores being best represented. Some material for exchange.

Historic and economic geology and lithology. 1000 specimens: 200 stratigraphic specimens illustrating all the geologic formations; Smithsonian collection of 200 illustrating dynamic and structural geology; 300 general. Material for exchange.

Zoology. 1500 specimens: mounted mammals, birds and reptiles; alcoholic and histologic preparations; shells; 1000 entomologic specimens.

Botany. 5000 specimens: the Sandberg collection of Minnesota flora, 300 genera and 500 species; the Rundstrom collections of 250 genera, 350 species of American flora, and 375 genera, 800 species of Scandinavian flora. Material for exchange.

Ethnology and anthropology. 700 specimens: implements, weapons and ornaments of the American Indians; numismatic collection of silver, copper and bronze coins.

Hamline university museum of natural history, St Paul. The museum is a part of the department of biology and geology, of which Henry L. Osborn is director. Assistants are employed from time to time as needed.

Paleontology. 1000 specimens: including a general collection chiefly Paleozoic; the Lillibridge collection of fossils chiefly mollusks from the Black Hills Mesozoic, but including a few vertebrates of tertiary age; N. H. Winchell collection of Paleozoic fossils from the central states.

Mineralogy. Specimens chiefly from the Central states, the Lake Superior copper region being well represented; collections from Gouverneur N. Y.; the Yellowstone national park; and the collections of N. H. Winchell, H. L. Osborn, C. A. Waldo and F. W. Dewart.

Historic geology. 1000 specimens; a series collected by H. L. Osborn, illustrative of the glacial drift at Hamline; ores of iron and copper received from the United States national museum; a general lithologic collection made by N. H. Winchell, also one illustrating structural geology.

Zoology. 100 skins of mammals; 200 mounted birds, 400 skins of birds, and 500 birds nests and eggs; 100 articulated and 250 disarticulated skeletons; 200 alcoholic vertebrates; 100 fragile objects, vertebrate and invertebrate, in glass boxes for class use; 500 alcoholic invertebrates; 500 anatomic preparations; 1000 mounted insects; 350 dried invertebrates, exclusive of conchological specimens; 500 conchological specimens; 1000 histologic preparations; and 1500 microscope slides.

The more important donors to these collections are, the United States national museum, H. L. Osborn, the Menage scientific expedition, Otto Lugger and Eddy H. Greeley.

Botany. 3300 specimens: the H. L. Osborn collection of 2000 specimens from the northern and eastern parts of the United States; the F. W. Dewart collection of 300 specimens of the Yellowstone national park flora; the Merrill Hitchcock collection of 500 specimens of Vermont flora; collection of Mrs Thomas G. Lee of flowering plants, a collection of fungi and lichens; and a local herbarium of 500 specimens.

Ethnology. 200 specimens: from Liberia, Africa, donated by Rev. B. F. Kephart and Eddy H. Greeley; 50 relics of the American Indians received from N. J. Lillibridge.

Minnesota academy of natural sciences, Minneapolis. Charles P. Berkey, *corresponding secretary.*

Paleontology. 1000 invertebrate fossils; 500 vertebrate.

Mineralogy. 2500 specimens.

Geology. 500 rich specimens.

Zoology. 100 mammals and reptiles, 100 reserve; 1100 birds (mounted), 3500 reserve; 500 corals; 1000 shells and miscellaneous specimens. Those marked reserve are not mounted and not on exhibition.

Ethnology. 1500 weapons, tools, clothing, etc.; 300 photographs from the orient. These with the specimens under zoology are almost exclusively from the Philippine islands and the collection is one of the most complete in the world.

In the library are 9291 publications of scientific societies.

Besides the above there are loaned to other neighboring museums large collections of certain groups not counted in the list.

Minnesota geological and natural history survey, Minneapolis, N. H. Winchell, *state geologist*.

Collections are in the custody of the University of Minnesota at Minneapolis and are described with the other collections of that university.

The geologic survey was concluded early in 1901. The publications remaining on hand were turned over to the general library of the University of Minnesota, William W. Folwell, librarian. Work in botany proceeds under the charge of Conway MacMillan and in zoology under Henry F. Nachtrieb, both of the same university.

University of Minnesota, Minneapolis. This institution has no distinctively university museum. It is however, charged with the care of the museum to be created by the geologic and natural history survey. The departments of zoology and botany have study collections which are not considered separate from the collections of the museum embraced under the geologic and natural history survey, and the heads of the departments are in charge of their respective collections. Conway MacMillan, *professor of botany*; C. W. Hall, *professor of geology and mineralogy*; Henry F. Nachtrieb, *professor of zoology*.

Paleontology. Geologic survey: over 9700 entries with many duplicates embracing 2000 fossils. For study, 2500 fossils and a fairly complete set of Ward's casts of fossils; the Sardeson collection of Paleozoic fossils which consists of a series of 32,500 specimens under 2500 entries. The collection of vertebrate fossils is begun, the anthropologic series number 300 entries.

Geology and mineralogy. Geologic survey; over 9700 entries with many duplicates embracing: 5700 rocks; 2000 minerals; 1500 thin sections of rocks and fossils; an extensive series of photographs and negatives representing geologic formations, physiographic features and microphotographs. Also for study 5000 rocks, 1400 thin sections of minerals and rocks; 6000 minerals, including the Kunz systematic collection; 2000 comprised in systematic collection; 3400 in reference collection; 1000 crystal forms; 2000 photographs; 500 negatives and several hun-

dred lantern slides. The collection of meteorites is one of high rank.

Zoology. 275,000 specimens: the reference and exhibition collections of dried and alcoholic specimens; entire and dissected specimens; sections, skeletons; models and skins; special collection of the birds, fishes, insects and mollusks of Minnesota.

The plan is to make the museum representative of the state and contemplates as full a representation of the entire fauna as possible, while extralimital material is added merely for completeness of illustration. The plan is to make the collection as complete as possible and afford facilities for students and investigators.

Botany. A herbarium of 325,000 dried specimens; 2000 jars of alcoholic and formalin material; 200 specimens of woods; 5000 plant portraits.

Minnesota species of Spermatophyta, Pteridophyta, Bryophyta, Algae, Fungi, and photographs of the same are always on hand for exchange. An exchange bureau is maintained, and the curator is in communication with hundreds of American and foreign collectors.

MISSISSIPPI

Millsaps college museum, Jackson. A. M. Muckenfuss, *professor of chemistry and physics*, in charge.

The collections are not large, and are used only for illustrative purposes. There is a small collection of local fossils.

Mississippi agricultural and mechanical college, Agricultural College. Glenn W. Herrick, *professor of biology*, in charge.

Historic and economic geology and lithology. 500 specimens.

Zoology. 10,000 specimens of insects; 70 specimens of invertebrates presented by the Smithsonian institution; a few fishes; fairly good collection of birds eggs.

Botany. A station (experiment) herbarium of 2000 phanerogams; a college herbarium of 2000 specimens; a station herbarium of 2000 fungi mostly parasitic.

University of Mississippi, museum of natural history and geology, University. Waller S. Leathers, *professor of natural history and geology*, in charge of museum.

Paleontology. Representative collection of invertebrates from the Cambrian formations upward; also sharks teeth; bones of mastodon, zeuglodon and other fossil vertebrates from the Tertiary and Pleistocene formations. A few zeuglodon vertebrae and fossiliferous concretions from Mazon creek, Illinois for exchange.

Mineralogy. A representative series of minerals, including most of the species described in Dana's *Manual*.

Economic geology. Collection made by the former state agricultural and geological survey, including rocks, soils (with many analyses of the same) and fossils of the state, arranged by counties, with some from adjoining states.

Lithology. A very fair collection, the basis of which was purchased from A. E. Foote of Philadelphia, and added to from time to time.

Zoology. Many mounted and alcoholic specimens; skeletons of vertebrates and dried invertebrates; shell collection of 10,000 varieties, purchased from Dr Francis H. Markoe.

Botany. An incomplete suite of cryptogamous plants.

Ethnology. Bones, pottery, fishhooks, arrowheads, etc., of the North American Indians and the Mound Builders.

MISSOURI

Bureau of geology and mines, Rolla. E. R. Buckley, *state geologist*. 8000 entries and 32,000 specimens illustrating the geology and mineral resources of the state exclusively.

Central college, Fayette. No report.

Christian university, Canton. No report.

Drury college, Springfield. Edward M. Shepard, *professor of geology*, in charge.

Paleontology. The collection consists of 400 specimens of Silurian, 100 Devonian, 1000 Lower Carboniferous, 500 Lower

Coal Measures, 500 Middle and Upper Coal Measures. Type specimens of Missouri Devonian fossils (*Missouri geological survey*, vol. 12, pl. 1).

Mineralogy. Tenney collection (Prof. Sanborn Tenney of Williams college) 400, Flanner collection (Dr T. U. Flanner, Michigan copper ores) 300, Missouri lead and zinc minerals 300. General collection of minerals 500.

Historic and economic geology and lithology. This collection consists of 500 specimens of Lower Carboniferous, 600 of lead and zinc minerals from all sources, Smithsonian national museum collection of rocks about 150. About 200 specimens of Tasmanian, Australian, New Zealand and Hawaiian rocks and ores.

Zoology. 200 specimens of West Indian corals and sponges; 150 specimens of the Smithsonian collection of marine invertebrates; 100 specimens of Hawaiian corals; 100 specimens of New Zealand shells; 200 specimens of Greene county (Mo.) reptiles and birds; 100 specimens of marine fishes of the Atlantic coast and the West Indies. General collection of 500 shells.

Botany. Herbarium of Greene county (Mo.) flora consisting of 600 species; herbarium of New England flora of 700 species; herbarium of 150 species of carices and grasses of United States; herbarium of 105 species of Hawaiian ferns; herbarium of 200 species of marine algae; herbarium of 200 species of fresh-water algae.

Ethnology. This collection consists of South African, Fijian and Hawaiian curios.

Prichett college museum, Glasgow. W. Newton Holmes, *professor of science*, in charge.

Paleontology. 10,000 specimens: Silurian system, 500 fossils; Carboniferous system, 5000 fossils, the brachiopods and crinoids of the Subcarboniferous being best represented; Devonian system, 200 fossils; Cretaceous formations of Texas, 1000 fossils, the *Ostrea* family being the best represented; some bones of a mastodon. 3000 duplicates for exchange.

Mineralogy. 2000 specimens: ores of silver, lead, and iron best represented; ores of tin, zinc, mercury and manganese; quartz, stalactites, etc., well represented. 500 duplicates for exchange.

Zoology. 800 specimens: mounted mammals and birds; alcoholic specimens; skeletons; shells, etc.; 100 specimens native birds; 400 alcoholic specimens of marine invertebrates. 200 duplicates for exchange.

Botany. A herbarium of 500 native plants, chiefly those flowering in the spring and early summer.

Ethnology. 250 specimens: polished stone axes; hatchets (one hematite hatchet); discoid stone; a few pieces of pottery and about 100 arrowheads, all relics of American Indians; a few specimens of bones of Mound Builders.

University of Missouri, school of mines and metallurgy, Rolla. George E. Ladd, *director*.

Paleontology. A student collection of 500 specimens.

Mineralogy. Working collection for blowpiping, etc. 3000 to 4000 specimens; working collection in cabinet, 1000 specimens; exhibition collection 2000 specimens. Several thousand specimens from the Joplin district, Missouri, for exchange.

Historic and economic geology and lithology. 3500 specimens.

University of the state of Missouri, university museum, Columbia. The staff of the museum includes the following professors in charge of their respective collections: George Lefevre, *zoology*; C. F. Marbut, *geology and mineralogy*; F. B. Mumford, *agriculture*; J. M. Stedman, *entomology*.

Paleontology. 1500 specimens: a general collection, representing particularly well the brachiopods of the Coal Measures; the Winner collection, including the fossil fauna of Kansas City and vicinity, and the Blair collection of mastodon remains. In 1892 fire destroyed a number of Swallow's type specimens of fossils.

Mineralogy. 1500 specimens: general but specially rich in calcite, dolomite, sphalerite, galenite, and chalcopyrite from Joplin Mo.

Lithology. 2000 specimens: a series illustrating Rosenbusch's classification of rocks; collections illustrating the geology of Baltimore Md., the Lake Superior region, the Green mountains and Missouri.

Zoology. Collections of Missouri mammals, birds, reptiles, amphibians and fishes; Ward's specimens of mammals and birds, illustrative of the principal groups; specially large collection of Astacidae from the United States; collections of marine invertebrates.

Entomology. Large Missouri collections including the remains of the original collections of C. V. Riley's *Missouri reports* and the Stedman collection. Some Missouri specimens for exchange.

Botany. A complete herbarium of the flora of Missouri and some exotics; special collections of fungi, grasses and trees of commercial value. Some Missouri specimens for exchange.

Anthropology. Skeletal, and other remains of the mound builders from Boone county, Mo., and numerous Indian relics from other parts of the state.

There is also an extensive museum of agriculture in connection with the university.

Washington university museum, St Louis. G. Hambach, *professor of geology*, in charge.

Palaeontology. 40,000 specimens giving a fair representation of all geologic formations; the Shumard collection; flora of the Carboniferous, Cretaceous and Tertiary systems. No duplicates for exchange.

Mineralogy. 1000 representative specimens.

Historic geology and lithology. 2000 specimens.

Zoology. 15,000 specimens representing all classes of the animal kingdom.

Westminster college, Springfield. No report.

MONTANA

College of Montana, Deer Lodge. No report.

Montana college of agriculture and mechanic arts, Bozeman. F. W. Traphagen, *professor of mineralogy and geology*; R. A. Cooley, *professor of zoology and entomology*; J. W. Blankinship, *professor of botany*.

Paleontology. 2000 specimens representing all geologic ages specially Upper and Lower Silurian, Tertiary and Miocene. Specimens of Lower Silurian brachiopods and Upper Silurian trilobites, and Montana Middle Cambrian and Cretaceous for exchange.

Mineralogy. 5000 specimens of Montana gold, silver, copper and lead ores; metallic minerals and their associates. Specimens of chalcocite, bornite, stephanite, bismuthinite, vanadinite, asphaltum, corundum, enargite, unusually fine goslarite and hyalite for exchange.

Historic and economic geology. 500 specimens: an educational series of rocks; Judith mountain series; Montana rocks generally; 113 Voight and Hochgesang oriented sections of rock-forming minerals. Montana metamorphics and eruptives for exchange.

Zoology. 3500 species, 7000 specimens: representative animals used in demonstration before classes, and Montana vertebrates (particularly birds) and insects. Specimens of birds and insects for exchange.

Botany. Herbarium of 6000 mounted specimens and as many more unmounted; several specimens of fungi, seeds, cones, etc. in trays for exhibition purposes, and 40 specimens of the native woods of the state. Specimens for exchange.

NEBRASKA

Creighton university museum, Omaha. William F. Rigge in charge.

The museum includes altogether 10,000 specimens, arranged for use in instructing students and including representative and characteristic rather than rare specimens.

Mineralogy. 500 labeled and classified specimens, and as many more unclassified.

Doane college biological and geological museum, Crete. D. B. Perry, *président*, in charge.

Paleontology. 350 specimens, mostly from the Silurian rocks, but covering nearly all geologic periods.

Mineralogy. 600 specimens.

Zoology. 250 specimens of mammals and birds; 200 fishes, amphibians and reptiles; 500 shells; and 200 marine and fresh-water invertebrates.

Botany. 2500 specimens: chiefly illustrative of Nebraska phanerogams, but represent forms from other states and Europe.

Ethnology. 150 specimens of implements, utensils, etc., of the American Indians and of African tribes.

Nebraska Wesleyan university, University Place. No report.

University of Nebraska state museum, Lincoln. Erwin H. Barbour, *acting state geologist*, curator.

Owing to lack of available space for exhibition purposes, the museum is not at present well arranged. Some valuable collections, chiefly of geologic and paleontologic material, have been obtained by class excursions from the university. 35,000 specimens have been added during the past three years by the state geological survey, being obtained chiefly from the Carboniferous and Dakota Cretaceous of Nebraska and surrounding states.

The archeologic, ethnologic, paleontologic and forestry collections are valued at \$50,000. Among the geologic material is a set of specimens of the core of a test well some 2500 feet in depth, bored near Lincoln.

The present museum is so overcrowded that arrangements have been made to store everything in fireproof buildings down town till a new museum can be built.

NEVADA

State university, Reno. No report.

NEW HAMPSHIRE

Dartmouth college, Butterfield museum, Hanover. The collections are in charge of the heads of the respective departments: C. H. Hitchcock, *geology, curator of museum*; William Patten, *zoology*; and G. R. Lyman, *botany*.

Paleontology. Collections are mostly incorporated with those illustrating historic geology. They include one of the James

Hall collections of New York fossils, obtained from the American museum of natural history; several large slabs of ichnites from the Connecticut valley; and several of Ward's casts of large vertebrate fossils.

Mineralogy. About 2000 specimens representing nearly 300 species and varieties and including the Frederick Hall collection. New England localities are best represented.

Historic geology. 4000 specimens: fossils and rocks, illustrating formations all over the United States, but particularly those of Connecticut, New York, Ohio, Indiana, Illinois, Iowa, Minnesota, Missouri, Kansas, Alabama and Colorado. 25 relief maps, one of New Hampshire and Vermont on a scale of 1 mile to an inch, and colored geologically. The sections are arranged geographically and are accompanied by colored geologic profiles to illustrate the relations of the several formations.

Economic geology. 2500 specimens: a collection of 1500, illustrating the occurrence of gold and silver ores in Montana, specially rich in the silver ores of the Cordilleras; marbles, slates and granites of New Hampshire and Vermont; and a series of petroleum specimens representing 100 localities.

Lithology. 11,700 specimens: volcanic rocks from Vesuvius and the Hawaiian volcanos, 350; massive igneous rocks of general distribution, 200; a special collection from the New Hampshire geological survey, collected to illustrate the survey reports, 250; a general collection of New Hampshire and Vermont rocks, 3500; a special collection from the White mountains, 1000; from the Ammonoosuc district, 1100; a series from the vicinity of Hanover N. H. 500; a series from the vicinities of Vernon N. H. and Bernardston Mass. 200; a set illustrating the geology of 16 sections crossing New Hampshire and Vermont, 3000; a collection of drift boulders illustrating the distribution of drift material in New England, 1500. They have been partially described in the New Hampshire reports and in bulletins of the American museum of natural history. Most of them are the official collections of the New Hampshire state geological survey.

Zoology. A collection of well mounted birds of the vicinity of Hanover, together with their nests and eggs; a collection of fishes from the United States; 2000 species of shells (mollusks) gathered by Prof. C. H. Hitchcock; 1000 species of New Hampshire insects mounted in pairs; a miscellaneous collection of about 1000 invertebrate specimens; and a large quantity of biologic preparations for use in laboratory work.

Botany. A general herbarium of 5000 species gathered by Prof. C. H. Hitchcock, and rich in ferns and marine algae; 1000 specimens of wood sections, seeds, etc., and many mosses and hepaticae; by donation from Prof. Trelease several thousand species, phanerogams and ferns, and by donation the herbarium of Prof. H. G. Jesup.

Ethnology and archeology. 500 aboriginal implements from Lake Winnipiseogee, and other localities; 90 skulls and pieces of pottery of the Mound Builders; 400 ethnologic specimens from Zululand, Alaska and the South Sea islands; many photographs of American Indians, and a full sized figure made by the Smithsonian institution, of Chief Joseph; a few Roman antiquities; a collection of Burmese and Japanese antiquities, and eight or nine unusually fine sculptures from Nineveh, obtained by Dr Wright about 1860.

The handsome museum building is the gift of the late Ralph Butterfield M.D. of Kansas City.

Keene high school museum, Keene. Percy S. Brayton, *submaster of the school*, curator.

Paleontology. 150 specimens of corals, mollusks and fishes, from the western states.

Mineralogy. 2000 specimens for class use.

Historic and economic geology and lithology. Collections very small.

Zoology. 3000 specimens: mounted mammals and birds; skulls and skeletons; shells and insects; and small collections of corals and reptiles.

Botany. 500 specimens illustrating the flowering plants and the ferns of New Hampshire.

Ethnology. 500 specimens: relics of the local tribes of American Indians including articles of clothing, arrow points, pestles, knives, etc.

Keene natural history society, Keene. George A. Wheelock, *president*.

The geologic collection of 1000 specimens is not systematic, but consists of miscellaneous local material. It answers well the needs of the high school teachers who have charge of it, and for whose benefit it is intended. There are also biologic collections.

New Hampshire college of agriculture and the mechanic arts, Durham. Clarence M. Weed, *professor of zoology and entomology*; Charles L. Parsons, *professor of chemistry and mineralogy*.

Geology. A set of the rocks of the state; a good sized reference collection of minerals; a relief map of New Hampshire and Vermont and a few corals and miscellaneous specimens.

NEW JERSEY

New Jersey geological survey, Henry B. Kümmel, *state geologist*.

The collections made by this department are in the custody of the New Jersey state museum and are described with the other collections of that museum.

New Jersey state museum, Trenton. Commissioners: state sup't of public instruction, Charles J. Baxter, *president*; state geologist, H. B. Kümmel, *secretary*; pres. state board agriculture, E. B. Voorhees; president of the state senate; speaker of the assembly; S. R. Morse.

Paleontology. Several thousand specimens representing Cambrian, Ordovician, Silurian, Lower Devonian, Triassic, Cretaceous and Tertiary. For type specimens see Whitfield's *United States monograph on Brachiopoda, Lamellibranchiata, Gastropoda and Cephalopoda of the Raritan clays and the greensand marls*.

Historic and economic geology and lithology. 3000 specimens: iron ores; zinc; clays; green sand marls, etc.

Mineralogy. 1500 specimens. Synoptic collection of minerals of the state.

Zoology. 325 specimens: birds and mammals with nests and eggs. Also a collection of insects injurious to forests, prepared by Dr John B. Smith of Rutgers college for exhibition at the Pan-American exposition.

Botany. Collection kept at Rutgers college. A new collection of New Jersey woods is being made, which contains now 100 specimens intended as an educational exhibit. It includes the leaves, flowers and fruit of the trees.

Ethnology and anthropology. A small collection of Indian relics.

Princeton university museums, Princeton. William Libbey, *professor of physical geography and director of the E. M. museum of geology and archeology*; Arnold E. Ortmann, *curator of invertebrate paleontology*; Marcus S. Farr, *curator of vertebrate paleontology*; Henry B. Cornwall, *professor of applied chemistry and mineralogy and director of mineralogical cabinet*; Alexander H. Phillips, *assistant professor of mineralogy*; George Macloskie, *professor of biology and director of the John C. Green school of science, biological museum*; Walter M. Rankin, *assistant professor of biology and curator of the zoological museum*; Allan Marquand, *professor of archeology and history of art and director of the museum of historic art.*

Paleontology. 15,000 species: skeletons of a mastodon, Irish elk, cave bear and some of the extinct birds of New Zealand; a skull of the Uintatherium and a remarkably complete skeleton of Cervalces; mounted casts of the gigantic reptiles and mammals of the Secondary, Tertiary and Quaternary ages; a very perfect collection of vertebrate and invertebrate fossils from Europe and America illustrating the principal organic forms of all the geologic epochs; fine Eocene, Oligocene and Miocene fossils, many of which are type specimens, procured in the west by the various collecting parties from the university; a series of fossil plants from Colorado, many of which are type specimens. The typical fossils selected agree, so far as possible, with those mentioned in Dana's *Geology* as characteristic of different geologic periods.

One of the most important collections in the geological museum is that made by the expeditions to Patagonia conducted by J. B. Hatcher in 1896-99. This consists of a very extensive series of Cretaceous and Tertiary invertebrates, including a large number of types of new genera and species, and of about 2000 mammals from the Patagonian and Santa Cruzian (Miocene) beds.

The mammals are remarkable not only for their variety, but also for their state of preservation, very many complete or nearly complete skeletons, representative of all the orders, being among them.

These collections form the subject of the forthcoming *Reports of the Princeton university expeditions to Patagonia*, now in course of publication.

Mineralogy. About 10,000 specimens. 2600 specimens: mostly crystals, bequeathed to the university by the late Archibald MacMartin of New York. The perfection of the specimens and the number of localities represented by each species make this collection one of special value.

There are also three cabinets of minerals in the laboratory of the school of science. The principal one contains over 5000 specimens, embracing nearly every mineral species. Two smaller cabinets, one with labeled and the other with unlabeled minerals, are provided for practice with the classes, and to these the students have free access.

A very fine collection of New Jersey zinc and iron minerals from the Sterling mines was recently presented to the university, and is exhibited in the main laboratory.

Historic geology. A unique collection of 5000 specimens of erratic boulders and drift material from Switzerland; a systematic series of the typical rocks and fossils of New Jersey; and one of the typical rocks of New York representing the series as described by the geologic survey of that state. The geologic collections are all arranged with a special view to the purposes of comparative study.

Lithology. In the laboratory of the school of science are 240 specimens of typical rocks, together with a large number of Fuess's and other rock sections for study.

Zoology. 1600 mounted and disarticulated skeletons of mammals, birds, reptiles and fishes. There are over 12,000 specimens in the ornithologic collections starting with a mounted collection of representative New Jersey birds. The relations of these to the avifauna of the world is shown by collections of unmounted skins in the following groups: North America, Europe, Indo-Australia and South America. The South American collection has been materially augmented through the work done by the Hatcher expeditions to Patagonia, the results being some 600 birds. The collections are further supplemented by some four thousand sets of eggs, many of them in nests, as well as much alcoholic material and many skeletons. 2000 European and Asiatic birds have recently been received through exchange with the British museum of natural history. Mr W. E. D. Scott is curator of ornithology.

Among the invertebrates are a series of ascidians, echinoderms, mollusks, 5000 specimens; corals, 6000 specimens; sponges and microscopic preparations of small forms. 1500 preparations illustrating comparative morphology of the vertebrate organs.

Botany. Collections are arranged for exhibition and also as a working laboratory for students. The plants are classified according to the *Pflanzenfamilien* of Engler & Prantl and include specimens from the different sections of the United States and from South America, Europe and Australia. Recently the herbarium has been increased by the addition of collections of hepaticae, mosses and other plants, made by Dr Hatcher in western Patagonia and Fuegia.

There are extra specimens for laboratory use and for dissection, together with the necessary library and instruments.

Archeology and ethnology. Relics of the Swiss lake dwellings and numerous implements of stone and bronze from Denmark;

several hundred flint instruments from most of the classic localities of the Paleolithic and Neolithic ages of France; pottery and human remains of the Mound Builders; several hundred specimens of Mexican and Peruvian pottery and a number of recent Indian relics; interesting ethnologic collections of objects, chiefly from Alaska and New Mexico, presented by Dr Sheldon Jackson to the theologic seminary of Princeton and transferred to this museum by the trustees of that institution, with the consent of the donor; a series of models of the cliff dwellings and pueblos of the southwest, executed under the direction of Dr Hayden.

There is also a museum of historic art containing collections illustrative of the history and processes of the graphic arts; reproductions of Greek and Roman coins and gems; specimens of Greek and Roman marble; a collection of bronze medals; casts of ivories from the Roman to the Gothic period. A series of casts from the arch of Trajan at Beneventum has been recently added.

The Trumbull-Prime collection, illustrative of the history of pottery and porcelain, has been arranged in new cases. Egypt is represented by sepulchral figurines, beads and amulets; Phenicia by numerous Cypriote vases; Greece, Etruria and southern Italy by Corinthian aryballi and fine examples of larger vases of black figured and red figured types. The Orient is further illustrated by specimens from Persia, China and Japan; South America by Peruvian pottery. The collection is rich in examples of European wares, to which England, France, Germany and Holland are the chief contributors, but Italy, Russia, Sweden and Switzerland are also represented. The collection comprises about 20,000 specimens. A small room in the same story contains a collection of pottery loaned by Mrs W. S. Livingston and is noteworthy for the illustrative material it furnishes for the early history of our country.

The staircase and basement are occupied by carefully selected specimens of casts of ancient and medieval sculpture, presented by the class of 1881 at its decennial. This collection was formed to illustrate the history of ancient sculpture in Egypt, Babylon

and Assyria, Persia, Greece and Rome and of medieval sculpture in Italy, France and Germany. There has been recently added from the same fund a collection of casts of renaissance sculpture.

Rutgers college, The George H. Cook museum of geology, New Brunswick. Albert H. Chester, *professor of mineralogy and chemistry, curator*, assisted by W. S. Valiant.

Paleontology. 5750 specimens divided among the various geologic systems as follows: Lower Silurian, including fossils from the earlier formations and a fine lot of trilobites, with appendaged *Triarthrus becki* from Rome N. Y. 300; Upper Silurian, 400; Devonian, 450; Carboniferous plant remains mostly from Pennsylvania, Germany and Nova Scotia, 300; animal remains, 300; Triassic, 75; Jurassic, 525, mostly from foreign localities; Cretaceous, 2500, mostly from New Jersey; Tertiary, 1000; Quaternary, 500.

A great many of the type specimens used by Prof. R. P. Whitfield in his report on the fossils of the clays and marls of New Jersey are in this museum.

Some of the more prominent fossils in the museum are the Mannington (N. J.) mastodon; the original of the eurypterid *Stylonurus excelsior*, of the Devonian; saurian remains from the Cretaceous formations of New Jersey; and a slab of Jura-Triassic sandstone from Morris county, N. J., showing footprints of 15 species of dinosaurians.

Mineralogy. 11,700 specimens: the George H. Cook collection of 4500 specimens, with a large showing of New Jersey minerals—specially from the Franklin zinc mines, and the various trap rock quarries through the state; the Lewis C. Beck collection of 3000 specimens, mostly collected in New York from 1830 to 1850; Prof. A. H. Chester's private collection of 4550 specimens, one of the finest private collections in the country, is in the laboratory for use in teaching.

Many duplicates for exchange.

Geology. 1500 specimens: basaltic columns, large rock masses, geodes, concretions, fulgurites, ripple and rain markings, mud cracks, glacial striae, etc.

Historic and economic geology. 1100 specimens: illustrating the rocks, iron and zinc ores, clays, sands, marls (including the fossil bones and shells found in them) of New Jersey; a core from a diamond drill showing a section of the rocks at the Franklin zinc mines 1378 feet in depth.

Duplicates for exchange.

Zoology. Working collections in general zoology, entomology, etc.; a right whale caught in the Raritan river; a giant crab from Japan; recent ganoid fishes; and 1550 specimens of recent mollusks.

The zoologic collections, and those of botany, agriculture, art, engineering, etc., are in their respective departments, and not open regularly to the public.

Ethnology. 1700 Paleolithic and Neolithic implements, known as the "J. H. Frazee collection", that are exhibited with the geologic material.

NEW MEXICO

New Mexico college of agriculture and mechanic arts, Mesilla Park. E. O. Wooton, *professor of biology and botanist of experiment station*, in charge.

Paleontology. 200 specimens: small and general, belonging to the biologist.

Mineralogy. 500 specimens: United States geological survey educational series of rocks; unclassified New Mexican material.

Zoology. 150 specimens: a few for demonstrative purposes; a large collection of insects containing types of recently described species, and particularly rich in scale insects of the world and New Mexico bees.

Botany. 4500 specimens, mostly New Mexican: herbarium of the experiment station and biologist's private herbarium; 25 types of Wooton's species and cotypes of Greene, Heller, and Aven Nelson; and F. S. Earle's recently named species. Local New Mexican flora for exchange.

NEW YORK

Alfred university museum, Alfred. E. S. Babcock, *professor of chemistry*, in charge of the mineral collections. The other collections are in charge of A. R. Crandall, *professor of natural history*.

Paleontology. 1500 fossil species, chiefly Paleozoic, illustrated by 10,000 specimens: the type collection of the Allen museum, including Mesozoic and Cenozoic fossils not yet fully arranged.

The collection is rich in fossil sponges from the Devonian formations, but poor in primordial forms.

Duplicates of fossil sponges and of the more common forms for exchange.

Mineralogy. Gold, silver, copper and other ores, illustrated by 600 specimens; a general collection of 1000 specimens of minerals, representing 200 species and varieties.

Historic geology and lithology. Collections illustrate New York formations, and partially the terranes of some other states. Duplicates of local rocks for exchange.

Zoology. 20,000 specimens: a few mounted mammals; mounted skins of 122 species of the local birds, with their nests and eggs; 2000 species of insects, not well preserved; 1000 specimens of marine mollusks; 500 univalves and other shells and 200 Unionidae.

A few birds, and many Unionidae and marine shells for exchange.

Botany. The department herbarium of 6000 specimens, illustrating 1200 species; a collection of the local woods in the Allen museum. Specimens of the local flora for exchange.

Ethnology. Collections of the Allen museum amounting to 5000 specimens: weapons, implements, ornaments, etc., of the American Indians; a collection of 1436 coins, one third of which are of ancient, the remainder being of modern nations; pottery and illustrations of the ceramic and other industrial arts, ancient and modern; also household belongings and objects relating to social and religious customs of various peoples.

Material of the local tribes of American Indians for exchange.

American museum of natural history, Central park, New York. Morris K. Jesup, *president*; Hermon C. Bumpus, *director*; John H. Winser, *secretary and assistant treasurer*; Albert S. Bickmore, *curator of the department of public instruction*; R. P. Whitfield, *curator of geology and invertebrate paleontology*, Edmund O. Hovey, *associate*; L. P. Gratacap, *curator of mineralogy and in charge of conchology*; Henry Fairfield Osborn, *curator of vertebrate paleontology*, W. D. Matthew and O. P. Hay, *assistants*; J. A. Allen, *curator of mammalogy and ornithology*, Frank M. Chapman, *associate*; Frederic W. Putnam, *curator of anthropology*; Franz Boas, *curator of ethnology*; Marshall H. Saville, *curator of Mexican and Central American archeology*, Harlan I. Smith, *assistant curator*; William Beutenmüller, *curator of entomology*; A. Woodward, *librarian*.

Geology and paleontology. INVERTEBRATE PALEONTOLOGY, 8000 type and figured specimens. Most of these are in the James Hall collection of geologic and paleontologic material based on the New York state natural history publications, illustrative of the paleontology of the New York system and consisting of a general collection of a large proportion of the invertebrate forms illustrated in those volumes; and also specimens of the fish remains of the same geologic formations both in New York and from the other states and Canada, where the same geologic formations are known.

The Holmes collection of fossils, illustrated in Tuomey and Holmes's *Pliocene and post-Pliocene fossils of South Carolina*; the type series of the minute fossils of the Spergen hill beds, Ind., which are figured and redescribed in volume 1 of the museum bulletin, and again in the 12th annual report of the Indiana geological survey; most of the specimens illustrated in the state cabinet reports; all the types of fossils illustrated in the bulletin of the museum, consisting of many rare and unique forms, including fossils from Lake Champlain and the surrounding regions; a very extensive collection of Cretaceous fossils from Jamaica W. I., containing many rare and peculiar forms of Rudistae, etc.; a very large and nearly complete collection of

the Cretaceous fossils from Syria, including the Mt Lebanon district; trilobites from the Potsdam sandstones of Wisconsin, figured and described in the 16th report of the state cabinet; a series of Niagara group fossils from Waldron Ind., illustrated in the 28th report of the state cabinet; the type series of eurypterids from the Waterlime beds of Waterville, Williams-ville and East Buffalo N. Y.; also the specimen of fossil scorpion from the same formation, described in the bulletin of the museum by R. P. Whitfield. This array of type material of invertebrate fossils brought together in one collection and in one room far exceeds that of any other collection known.

The department exhibits collections illustrating the geology and paleontology of Iowa and Wisconsin as given in the geologic reports of those states, with geologic specimens showing the grouping of fossils in the rocks and the lithologic and phenomenal features; a typical series of the bryozoans of the Cincinnati beds, described, determined and labeled by E. O. Ulrich; a large collection of fossil fishes from the Green river and Twin creek Tertiary beds of Wyoming; many from the Jurassic slates of Solenhofen, Bavaria; and a large collection of Devonian fossil fishes from the Portage shales of Lorain county, O. presented by W. E. Dodge. There is also a collection of fossil fishes of the Jura-Trias beds of the Connecticut valley and Boonton N. J., and a general collection of fossils from various European countries, from different sources, largely from Prof. Karl von Zittel and Prof. Lindström, containing a typical series of the fossil plants from Oeningen, identified and labeled by Prof. Heer; a collection of Devonian fossil plants obtained by exchange from Sir William Dawson; an interesting and instructive series of fossil cycad trunks from Dakota, and a series of fossil gums from Demarara, Zanzibar etc., inclosing leaves, insects, arachnoids, etc.

VERTEBRATE PALEONTOLOGY. A The Cope collection of fossil mammals of North America gathered by the late Prof. Cope between 1870 and 1890, and presented to the museum by trustees and friends in 1895 and 1900. It contains 500 types and 1000

figured specimens in a total of 9000: types of nearly all the species described by Prof. Cope, except of those collected by the Wheeler survey and now in the national museum.

B Fossil mammals collected by American museum expeditions 1891-1901 in the ancient lake basins of the west, specially those of Tertiary age: all types of species described, and specimens figured in American museum bulletins. Only a part has yet been prepared for exhibition.

C Fossil reptiles collected in the western Jurassic, Cretaceous and Tertiary beds by American museum expeditions. Not yet on exhibition.

D Exchange collections from European museums, Munich, Oxford, Paris, London, Stuttgart and Leipzig.

E Pampean collection by Ameghino and others purchased by Prof. Cope in Paris, 1878, and sold by him to the American museum in 1900.

F Other specimens presented by friends or purchased by the museum.

Specially noteworthy features of the exhibits are: Series showing the evolution of the horse, rhinoceros, titanothere, amblypod, sloth, tapir and other western American types; complete mounted skeletons of Titanotherium, Palaeosyops, Hyrachtherium (the four-toed horse), Coryphodon, Hoplophoneus (a saber-tooth tiger), Aceratherium, Metamynodon and Hyrachyus (the three American types of rhinoceros), Phenacodus and Euproctogonia (primitive ungulate types), mastodon, Irish elk, and numerous others not yet ready for exhibition; fine series of complete skulls of Uintatheres (Dinoceras), titanotheres, American rhinoceroses, etc.; the Mesozoic Mammalia or multituberculates and early American primates, primitive ungulates and carnivores.

The specimens not placed on exhibition are intended for use as study collections, and are fully labeled and arranged so as to be most easily accessible to students.

Mineralogy. The famous Bement collection, with which is incorporated the reserve series; the Tiffany gem collection, now

known as the Morgan gift, separately installed; a collection of 500 meteorites, representing 450 falls with two large Greenland irons brought back by Lieut. Peary; massive specimens of Bisbee copper ores with several stalactites delicately colored by blue and green copper carbonates, and a fine series of wall case specimens extending over 1500 running feet of shelves. There is in connection with certain of the collections an introductory series embracing a group of photographs of mineral localities.

Historic geology. Besides those mentioned with paleontologic material are: a series of fossils illustrating two thirds of the species in Dana's *Manual of geology*, 3d edition, three fourths being the original specimens figured; a series of rocks collected by Prof. C. H. Hitchcock, illustrating the lithologic features of the White mountain ranges and a series illustrating 12 sections across New Hampshire and Vermont, collected and labeled by the author of the reports on the geology of those states; rocks and fossils illustrating the geology of the Island of Yesso, Japan, from the Japanese governmental survey.

Economic geology. 1000 different samples, cut uniformly with one face polished, of building and ornamental stones of the United States.

Zoology. MAMMALS. 1000 mounted specimens, about 16,000 skins, and nearly the same number of skulls and skeletons. The exhibition collection includes a special series of groups illustrating the species found within 50 miles of New York city, and also several of the larger mammals of North America, as the bison, moose etc.

BIRDS. 65,000 specimens, of which about 12,000 are mounted and on exhibition, and about 50 groups of North American birds mounted to show their nesting habits with facsimile reproductions of their natural surroundings. The bird collection includes a large number of skeletons and many nests and eggs.

REPTILES, BATRACHIANS, AND FISHES. The collections of lower vertebrates are large and exhaustive, but at present only a few examples are on exhibition.

INSECTS. Between 350,000 and 400,000 specimens from all parts of the world. It is particularly rich in the Lepidoptera

and the Coleoptera, represented by large suites of specimens showing the variation and intergradation of the species. Contains many type specimens and valuable uniques. The exhibition collection is represented by many thousand specimens, viz, insects found within 50 miles of New York city; a general collection of beetles; a collection showing insect architecture and mimicry; an economic collection and collections of butterflies of the world.

• **INVERTEBRATES.** An exceedingly valuable collection of corals is temporarily installed in Mineral hall. Other collections of invertebrates have been placed in various portions of the building till a suitable exhibition hall has been provided.

SHELLS. The John Jay (Wolfe memorial) collection with which is incorporated the great William Haines cabinet, the D. Jackson Steward collection, and the Binney and Bland collection of American land shells; all arranged and displayed with illustrative maps, figures and photographs.

Botany. The Jesup collection of woods presents a complete series of sections of the trees of North America. These sections are so cut and prepared as to show the adaptability of the various kinds of woods for various uses in the arts, and they are accompanied by illustrations colored by hand, which show the plants in flower and fruit.

Anthropology. Contains specially rich ethnologic collections from the North Pacific coast of America and from the Eskimo regions of Greenland, Hudson bay, and Alaska; ethnologic exhibits from the United States, Mexico, Eastern Siberia, China, Japan, Polynesia, and Africa; archeologic collections from various parts of the United States and Canada; a specially important exhibit from Mexico and Central America, of value in the study of symbols and hieroglyphs; also collections of pottery and objects of jadeite and copper; large groups of specimens illustrating the ancient cultures of the West Indies, Colombia, Peru, Bolivia, and Europe; and the Andrew Ellicott Douglass collection illustrating the forms of prehistoric implements in the United States and other countries.

Library. The library, formed principally through large and generous donations, contains 54,050 volumes and a large number of pamphlets and maps. These include works on the various branches of natural science, viz, anthropology, archeology, ethnology, conchology, entomology, ornithology, mammalogy, ichthyology, herpetology, botany, anatomy, geology, paleontology, mineralogy, agriculture, general zoology, voyages and travels and history relating to natural science. The periodicals and serials in the library have been obtained largely through the exchange of the museum annual reports, bulletins and memoirs.

Binghamton academy of sciences, Binghamton. N. M. Pierce, *president*.

This society owns several collections, but owing to the need of exhibition rooms, the material is not classified or arranged for reference.

Brooklyn institute of arts and sciences museum, Brooklyn. Franklin W. Hooper, *director*; William H. Goodyear, *curator of fine arts*; Alfred G. Mayer, *curator of natural sciences*; John S. McKay, *curator of physical sciences*; George K. Cherrie, *curator of ornithology*; Jacob Doll, *curator of entomology*; Carl Schaeffer, *assistant curator of entomology*; Abel J. Grout, *curator of botany*; Susan A. Hutchinson, *department librarian*.

Paleontology. The Gebhard collection of 7000 fossils representing all the formations of Schoharie county; the Eugene G. Blackford collection of fossil fishes; the Frederick Braun collection (loan) of fossils, and minerals, 2000 specimens and a general collection in paleontology.

Mineralogy. A general collection of more than 3000 specimens.

Lithology. Collections of European plutonic rocks and of the rocks of New York city and vicinity.

Entomology. The Berthold Neumoegen collection of Lepidoptera, numbering more than 50,000 specimens; the Edward L. Graef collection of Lepidoptera, numbering more than 20,000 specimens; the Jacob Doll collection (loan) of Lepidoptera, numbering more than 40,000 specimens; and the Calverly collection

of Coleoptera and Lepidoptera, numbering more than 20,000 specimens.

Conchology. A general collection of more than 12,000 specimens.

Ornithology. A general collection of 1200 mounted birds and bird skins.

General zoology. A collection of mammals, reptiles and fishes and invertebrates, estimated at 15,000 specimens.

Botany. A collection of mounted specimens of flowering plants numbering 40,000 specimens including collections presented by William Calverly, the late Rev. Charles H. Hall D.D. and the late Rev. George D. Hulst Ph.D.

Ethnology and archeology. The William Wallace Tooker collection of 8000 Indian relics of Long Island. The Charles A. Schieren collection of pottery from the cliff dwellers and Pueblos of the southwest. The Sturgis collection (loan) of implements from the South Sea islands. The C. W. Riggs collection of pottery from the ancient Pueblos of New Mexico and Arizona. Also collections from the Swiss lake dwellers, from the mounds of the Mississippi Valley, Mexico and Peru.

Geography. Geographic collection, comprising more than 4000 maps, charts, cartoons, globes, models, atlases and other apparatus and publications.

Fine arts. The Tissot collection of 450 pictures illustrating the life of Christ. A collection of paintings presented to the institute, and a loan collection of paintings. A collection of casts representing Greek and Greco-Roman sculpture. 6000 photographs illustrating the history of art. Also collections of engravings, etchings and coins. The Robert B. Woodward collection of ancient glass, mainly from Syria. Collections of Japanese pottery and articles of virtu.

Buffalo society of natural sciences museum and library, Library building, Buffalo. Elizabeth J. Letson, *director*; Lee H. Smith, *president*; T. Guilford Smith, *vice president*; James Savage, *secretary*; Philip Smith, *librarian*.

Paleontology. 31,000 specimens including duplicates: 1598 labeled fossils from foreign localities; the local collection of 567 specimens, particularly rich in crustaceans from the Waterlime group in the vicinity of Buffalo, there being some 80 varieties and 200 specimens of *Pterygotus*, *Eurypterus*, and *Ceratiocaris*; some interesting fish remains from the Corniferous, Hamilton and Portage groups, among which are specimens of the ventral armor of *Dinichthys*, plates of *Homosteus* (?), scales of *Paleoniscus*, etc. Material from the vicinity of Buffalo for exchange.

Mineralogy. The "Wadsworth collection" of 2836 specimens almost entirely from European localities, and specially rich in fine groups of fluorite, calcite, quartz and iron ore, of which there are some duplicates for exchange.

Historic geology. Local 573 specimens; general 1602 specimens.

Lithology. 2505 specimens.

Zoology. 7079 specimens: herpetology, 441; ichthyology, 144; conchology, 3332; entomology, 1535; ornithology, collection of 479 local and 596 foreign birds; 460 trays of eggs; mammalogy, 92 specimens, including a series of six American bison, whose fur shows the changes undergone at different seasons of the year.

Botany. 14,935 specimens: a very complete herbarium from Buffalo and vicinity.

Ethnology. 5000 specimens: 300 specimens of pottery from the province of Chiriqui, Central America; relics of the mound builders, mostly from Arkansas; and cliff dwellers pottery from Colorado; 3000 relics of the American Indians from their burial grounds near Buffalo. The greater part of these specimens are pottery, with a few flint implements. A large collection of North American Indian baskets and collection of material from the west coast of Africa.

One room in the building is devoted to the geology of Buffalo and vicinity.

Buffalo state normal school museum, Buffalo. I. P. Bishop in charge.

Paleontology. Three or four hundred specimens of Paleozoic invertebrates, mostly from the Silurian and Devonian systems.

Mineralogy. 300 species of the more common minerals collected from various sources; one set of Ward's "normal school" collection of 185 specimens, and a set illustrating color, glance, cleavage, etc. The species occurring in the metamorphic rocks of New York are well represented.

Historic geology. 50 specimens of metamorphic rocks, and stratified rocks from the typical localities.

Zoology. 100 mounted specimens of birds, and 50 alcoholic specimens, mostly vertebrates.

Botany. A herbarium of 300 or 400 species illustrating the local flora.

Canisius college, Buffalo. Rev. Frederic J. Hillig S. J., *professor of sciences*, in charge; Rev. Henry Wolff S. J., *assistant curator*.

Paleontology. 1000 specimens: 300 New York fossils; 300 Cretaceous fossils (Maastricht, Holland); 75 from the Bad Lands, South Dakota; 50 specimens of petrified wood.

Mineralogy. 800 specimens best representing calcite and silicates.

Historic and economic geology and lithology. 550 specimens: 250 rocks arranged by Ward, Rochester; 300 chiefly local.

Zoology. 50 North American and European mammals; 300 birds from United States, Austria and Denmark; 100 reptiles, etc. including some rare specimens from India; 2500 insects, illustrating the principal orders, specially Coleoptera and Hymenoptera, and including specimens from India, Brazil, Egypt, West Indies, Holland, etc.

Botany. 1600 specimens: American herbarium, 800; European herbarium, 100; European fungi, 500; seed collection, 200.

Ethnology and anthropology. 3000 specimens: Indian curios (Dakota), 50; old English curiosities, 300; coin collection including old Roman and medieval silver coins, 2500.

The museum also possesses 300 old books from 250 to 400 years old, including an interesting collection of about 50 old Bibles.

Colgate university museum of geology and natural history, Hamilton. Albert Perry Brigham, *curator*.

Paleontology. Collection is arranged zoologically, and contains several hundred specimens, chiefly of Paleozoic age.

Mineralogy. 1500 specimens fairly representative of all the groups.

Lithology. 500 specimens.

Historic geology. 1600 specimens largely of Paleozoic age.

Economic geology. 50 cubes of building stones from various horizons; 200 bottles of crude petroleum from most of the known petroleum regions; 25 specimens of oil sands, and 50 refined products of petroleum; and several hundred specimens of ores of gold, silver, copper, iron, etc.

Zoology. 1400 mounted birds; 1300 invertebrates, including many fine corals and tropical shells.

Botany. The Douglas herbarium of species from northeastern United States, of 1600 specimens, in 33 volumes; the Cobb collection of 1100 specimens of mosses, lichens, and ferns.

Ethnology. Garments, utensils, weapons, etc., from foreign missionary fields.

College of the City of New York, New York. William Stratford, *professor of natural history*, in charge of museum.

Paleontology. 500 specimens used chiefly for teaching. New York state formations best represented.

Mineralogy. 7500 specimens: consisting of a type collection of 1500 specimens; minerals of New York city, specially of the island of Manhattan, 2500; and sets for teaching.

Historic and economic geology and lithology. 2400 specimens.

Zoology. 3750 specimens: 1) type collections of vertebrates and invertebrates; 2) birds of New York city, Zerega collection; 3) insects of New York city, Dean collection; 4) fishes of New York city, Blackford collection; 5) many exotic forms; 6) corals, Decker collection; 7) corals, McFarlane collection; 8) Decker miscellaneous collection.

Botany. 550 specimens consisting of a working herbarium and several small collections of woods, seeds, fibers and fabrics.

Ethnology and anthropology. Small collection used for teaching.

The museum represents the local fauna and flora, minerals and rocks. A very complete set of zoologic types. A collection representing the industries of the city, e. g. furs, textile fabrics, tobacco, etc.

Columbia university museum, Columbia university, Morningside hights, New York city. Collections are in charge of the professors in the various departments: geology and paleontology, J. F. Kemp, assisted by A. W. Grabau, *adjunct professor*, and A. A. Julien, *curator*; mineralogy, A. J. Moses, assisted by L. McI. Luquer, *instructor*, A. F. Rogers, *tutor*, and J. S. McCord, *assistant*; zoology, H. F. Osborn, and E. B. Wilson, assisted by Bashford Dean, *adjunct professor*, G. N. Calkins, *instructor*, O. S. Strong and J. H. McGregor, *tutors*; botany, L. M. Underwood, assisted by C. C. Curtis, *tutor*, and J. K. Small, *curator*.

Paleontology. 50,000 specimens: extensive collections in invertebrate paleontology and fossil fishes, containing numerous type specimens in each of these divisions and specially rich in fishes from the formations of the Devonian and Carboniferous systems. The extensive collections of fossil plants formerly in this museum are now deposited at the New York botanic garden. Many duplicates for exchange.

Mineralogy. 25,000 specimens: an introductory collection illustrating the physical properties, characters, etc., of minerals; a systematic collection of many thousands of specimens of very wide distribution; working collections for use of students in the laboratory and in lectures. Many duplicates for exchange.

Historic geology. An attempt is made to illustrate the stratigraphy of North America, and to a smaller degree, of Europe; a dynamic collection illustrating the genesis and alteration of rocks.

Economic geology. Collections very complete illustrating specially the resources of North America and including ores, building stones and the minerals composing them; minerals used in the chemical industries.

Lithology. 25,000 specimens: working collections of rocks for both elementary and advanced work in petrography. Material for exchange.

Zoology. A good working series, specially rich in the Puget sound fauna, and embryologic preparations.

Botany. 500,000 specimens: the university collection proper; collections of the following botanists: Torrey, Meisner, and Chapman; the Austin and the Jaeger moss herbariums; and many smaller collections. Collections and library will be placed in the Bronx park botanic garden, where the advanced work will be carried on. Many duplicates for exchange.

Ethnology. The university avails itself of the collections of the American museum of natural history.

Cornell university museum, Ithaca. There is no museum staff, the collections being in charge of the professors of the several departments. Geology (including paleontology, mineralogy, economic geology and physical geography), Ralph S. Tarr, *professor of dynamic geology and physical geography*; Gilbert D. Harris, *assistant professor of paleontology*; A. C. Gill, *assistant professor of mineralogy and petrography*; Heinrich Ries, *assistant professor of economic geology*, and student assistants. Department of entomology and invertebrate zoology, John H. Comstock, *professor of entomology and general invertebrate zoology*; M. V. Slingerland, *assistant entomologist*; Alexander D. MacGillivray and W. A. Riley, *instructors in entomology*. Department of vertebrate zoology, Burt G. Wilder, *professor of neurology, vertebrate zoology and physiology*. G. S. Hopkins, *assistant professor of veterinary anatomy and anatomical methods*; B. B. Stroud, *instructor in physiology, vertebrate zoology and neurology*. Department of botany, George F. Atkinson, *professor of botany*; L. H. Bailey, *professor of general and experimental horticulture*; W. W. Rowlee, *assistant professor of botany*; G. N. Lauman, *instructor in horticulture*; E. J. Durand and Karl McKay Wiegand, *instructors in botany*, and Robert Shore, *assistant to professor of botany and head gardener*. Department of classical

archeology and history of art, Eugene P. Andrews, *instructor in classical archeology and curator of the museum of casts.*

Paleontology. Very complete collections including the following valuable material: The Jewett collection, accumulated by the late Col. Jewett when curator of the state cabinet of natural history, which is specially rich in New York fossils, containing many of the original specimens described in the state reports, and not a few unique specimens; rich faunas of the Cretaceous and Tertiary formations along the eastern and southern parts of the Union; a large number of characteristic English and European fossils; a fine series of English Mesozoic fossils; of Tertiary fossils from Santo Domingo; of preglacial fossils from Sweden; and numerous smaller collections from various typical localities in our own country; the Ward series of casts; the unique collection from Brazil made by Prof. Hartt and party on the Morgan expedition, containing the original specimens and a great number of duplicates.

Mineralogy. A large series of exhibition specimens arranged systematically and many thousand specimens arranged in study series; the Silliman collection accumulated by the late Benjamin Silliman jr, and illustrating the rarer and commoner mineral species; notable additions made from year to year by purchase and donation.

Economic geology. Collections illustrating the ores and useful minerals of the United States and to some extent foreign countries, and, though of recent date, already beginning to represent in detail the resources of the country. The collections of raw materials are supplemented by manufactured products. A number of mine models are being added.

Physical geography. An extensive series of maps, models and photographs of physiographic phenomena, largely for class use.

Zoology. The extensive collections are divided into exhibition and study series. The greatest pains have been taken to obtain and exhibit representative animal forms from all parts of the world, and carefully made dissections illustrating zoologic and morphologic ideas, such as the unity of general structure under

diversity of external form and mode of life; resemblances and differences between members of widely divergent types, and also between closely related groups, as man and the apes; the existence of apparently useless or injurious organs, etc. There is abundant material for the investigations of advanced students. In the number of well preserved and instructively prepared specimens of the brains of man and other animals, the museum is believed to be unequaled in this country.

The invertebrates include an excellent collection of corals and a very large collection of shells, the Newcomb collection. The museum also contains the complete series of glass models of invertebrates made by Blaschka, the papier-maché models of Auzoux, and a complete set of zoologic diagrams of Leuckart. The laboratory is kept supplied with alcoholic specimens of the typical marine forms studied by the students and supplied to them at cost.

Entomology. Many exotic insects and specimens of a large proportion of the more common species of the United States, which have been determined by specialists, and are accessible for comparison; sets of specimens illustrative of the metamorphoses and habits of insects; duplicates in the laboratory for the use of students; an equipment of microscopes and other apparatus necessary for practical work in entomology; an extensive and constantly increasing collection of histologic and embryologic specimens; full sets of typical specimens for study and comparison by the students.

Botany. Collections are very extensive but are not exhibited in the museum proper. The large greenhouses in connection with Sage college adjoin the rooms of the department, and are filled with many exotics representing the pteridophytes, gymnosperms and angiosperms, and offer available material at all seasons for studies in development, and histology, and furnish living plants for illustrative material for many of the lectures.

Space is provided for the study of plant growth, physiologic experiments, and for the handling and treatment of greenhouse plants, the latter being in charge of the head gardener of the de-

partment. The department also contains a large and growing herbarium, as well as collections of fruits, cones, nuts, fibers, a general collection of economic products, and a large number of specimens of the woods of different countries.

The flora of the region of Ithaca is very rich in species, and presents excellent opportunities for the student of systematic botany, and some facilities in the study of geographic botany.

Excellent facilities are offered to the students who are fitting themselves for (experiment) economic work in the courses of plant histology and in the study of the fungi. While the laboratory is distant from the seashore, it is well supplied with material of the marine algae for morphologic and developmental study of typical forms, and material preserved specially for the purpose is also supplied for investigations in development.

The collections also include the Auzoux and Brendel models representing the different groups of the plants, and other illustrative material in the way of charts, maps, etc.

Archeology. Collections are in a department by themselves. The museum of classical archeology, occupying the first floor of McGraw hall, is composed chiefly of casts representing the history of Greek and Roman sculptural art, but is also supplied with various plans, models, reconstructions, facsimiles of coins, etc. The nucleus of the collection was purchased with a fund of \$7000 donated for the purpose by the Hon. Henry W. Sage. The instruction in archeology and history of art is given in part in the museum itself.

There is also a series of several thousand photographs of ancient ruins and architecture.

Glen Island museum of natural history, New Rochelle. Lewis M. McCormick, *curator*.

Zoology. Specimens comprise: 500 mounted birds, mostly from the state of New York, but including a few brilliant colored tropical birds; 4000 specimens of shells, 200 of corals, 100 of sponges, and a few skeletons, including a camel's and ibex's, and one of the three skulls of the Atlantic right whale preserved in this country; also in the zoologic garden, several hundred specimens of birds and animals confined in cages.

Botany. 500 specimens: an excellent series of the algae of Long Island sound.

Ethnology. Weapons and utensils from Somaliland, and the west coast of Africa, from Arabia and Egypt; also relics of the American Indians, of the pioneer settlers of America, and of the war of the rebellion; American coins and script money; an interesting collection relating to the whaling industry of New England.

The Glen Island museum is maintained and arranged for the instruction and entertainment of visitors to the resort, and is not intended so much as a place for research as for popular illustration in the various branches of natural history. To this end, special attention is being given to the descriptive labeling of specimens, and to the use of pictures, specially with the ethnologic exhibits. Typical, large, showy specimens receive the preference over the rarer forms prized by museums of research, but a strict standard of authenticity is maintained in all the collections.

Hamilton college, Clinton. Charles H. Smyth jr, *Stone professor of geology and mineralogy.*

Paleontology. 2500 specimens of fossils and rocks illustrating the geology of New York; 1750 illustrating the formations and the life of the United States; 600 fossils chiefly from Silurian formations of Europe; 500 fossil corals from the United States.

Mineralogy. A series of 10,000 specimens of minerals, of general distribution; a special series of New York minerals called "The Oren Root collection of New York state minerals."

Historic geology and lithology. 250 specimens from the new red sandstone, besides those mentioned under paleontology; United States geological survey educational series of rocks, 156 specimens; 80 specimens to illustrate the geology of the Lake Superior region; a large number of Adirondack rocks.

Economic geology. 1000 specimens of ores, coals, petroleums, building stones, etc.

Zoology. 2000 specimens of land, fresh-water and marine shells and a rare collection of Japanese shells; 300 ornithologic specimens from China; a case of New Zealand birds from the *Transit of Venus* expedition of 1874; 300 birds from Oneida

county, N. Y.; the Barlow collection of 13,000 entomologic specimens to which Judge Barlow has added valuable collections in ornithology and comparative anatomy; a series of 391 Japanese insects.

Botany. 3354 flowering plants and 395 ferns; a collection from China; Sartwell herbarium, the result of 50 years' work in botany, containing 8000 specimens of plants cured, labeled and classified in 62 volumes, and including 451 mosses, 226 lichens, 342 seaweeds, 600 fungi, 575 ferns, 314 grasses, 200 Ericaceae.

Hobart college museum, Geneva. As the chair of geology is vacant at present, the museum is in charge of Herbert R. Moody, *professor of chemistry*.

The paleontologic, geologic and mineralogic equipment comprises many thousands of specimens and many duplicates, but no catalogues are available at present.

Paleontology. Representative collection of the New York terranes; a nearly complete set of Ward's casts of vertebrate fossils; the original of Ward's cast of *Castoroides ohioensis*.

The collections in the departments of natural history and in ethnology are representative, but are in need of better facilities for exhibition.

Long Island historical society museum, Brooklyn. The office of curator vacant. Mary E. Ingalls, *assistant curator*, in charge.

Paleontology. 892 specimens: chiefly from New York state, and donated by the state geologic survey.

Mineralogy. A few hundred specimens, chiefly from New York state.

Historic geology. A series of 746 specimens of rocks, sands and clays from the glacial drift of Long Island; 148 of the rocks of Manhattan Island; charts of the rocks cut through in boring for the piers of the Brooklyn bridge, and for wells at Jericho L. I., College Point L. I. and Woodruff's pier, Brooklyn; cores from diamond drill borings at Hunters point, foot of Atlantic avenue, Brooklyn, and off the Battery point, New York city; 10 specimens from a well at Jericho L. I.; 5 from a well of the Nassau gaslight co., Brooklyn; 47 from Barnum's island, East Rockaway bay; 6 from Calvary cemetery, Laurel Hill Brooklyn; 5 from Fort Lafayette; 50 from Woodhaven L. I.; 30 from the

piers of the Brooklyn bridge; 11 from Wheatley hill; and 6 from Westbury station L. I.

Economic geology. Marbles from the United States.

Lithology. A few hundred specimens, including a general collection; 168 specimens of sands, clays and peats.

Zoology. 2000 specimens: 119 mammals; 750 specimens of the birds of Long Island, representing nearly all the native species; 923 birds eggs; 198 reptiles; many of the crustaceans and nearly all the shells of the Long Island coast; and a large collection of land and marine shells from the East and West Indies.

Botany. 4000 specimens: 87 species of woods native to Long Island; 800 land plants, including mosses and lichens; nearly complete collection of marine and fresh-water algae of Long Island; a herbarium of 3000 specimens of the flora of the western and southern states collected by the late Prof. George Scarborough of Vineland N. J.; large collection of foreign algae; 80 sheets of English algae prepared by Dr John Lightfoot, author of *Flora Scotia*, published in 1777.

Ethnology and archeology. 1600 specimens: 782 Indian relics from Long Island, including axes, scrapers, arrow and spear points, pottery, etc.; 93 Indian antiquities from western mounds; 108 specimens taken from graves at Ancon, Peru; 18 from Mexico; eight carvings from temples in southern India; musical instruments from India; material from the Pacific islands; Chinese games, dominos and cards; 80 Egyptian relics from tombs of the kings, near Thebes, including cloths, carved wooden images, heads, etc.; 92 specimens from China and Japan; a cast of the Rosetta stone; and cast of the egg of the Aepyornis, or "roc" of eastern tradition; case of relics from the wars of the revolution and rebellion.

Natural science association of Staten Island, New Brighton. C. A. Ingalls, *curator*; Arthur Hollick, *secretary*.

Mineralogy. 200 specimens: minerals from the serpentine area which extends from New Brighton to Richmond, Staten Island; minerals from the trap quarries at Graniteville; and those from the limonite beds.

Lithology. 200 specimens: 50 representing the native rocks of Staten Island (Archaean, Paleozoic, Triassic, Cretaceous and Tertiary); the remainder, erratics from the drift.

Paleontology and historic geology. 500 specimens: granites and serpentines of the pre-Cambrian; Mesozoic fossil plants in red shale and diabase of the Triassic; fossil plants and mollusks in the clays and specimens of fire clay and kaolin of the Cretaceous; silicified corals and fossil plants in the yellow gravel and limonite of the Tertiary; fossils from the boulders of the glacial drift, plant remains and mastodon molars; scratched boulders, clays and gravels, etc., of the glacial period of the Quaternary.

Zoology. 600 specimens: mammals; birds and their eggs; insects; crustaceans and shells.

Botany. 3000 specimens: the herbariums of Dr N. L. Britton, and Dr Arthur Hollick, representing the flora of Staten island.

Ethnology. 400 specimens of local Indian relics, including axes, arrowheads, hammerstones, net sinkers, pottery, etc.; also historic relics of the revolutionary war, including muskets, cannon balls, military buttons, spurs, coins, etc.; some old views, pamphlets, newspapers, posters, etc., relating to Staten island history.

The museum is strictly local, hence no effort has been made to exchange specimens.

New York state museum, University of the State of New York, Albany.

ADMINISTRATION AND GEOLOGY. Frederick J. H. Merrill, *director and state geologist*; Henry H. Hindshaw, *assistant in geology*; Frederick C. Paulmier, *assistant in zoology*; Herbert P. Whitlock, *assistant in mineralogy*; Harry C. Magnus, *junior assistant in geology*; Joseph Morje, *clerk and stenographer*; C. Adelbert Trask, *junior clerk*; Edward C. Kenny, *stenographer*.

PALEONTOLOGY. John M. Clarke, *state paleontologist*; Rudolph Ruedemann, *assistant state paleontologist*; D. D. Luther, *field assistant*; G. S. Barkentin, *draftsman*; Philip Ast, *lithographer*; Jacob Van Deloo, *clerk and stenographer*; Martin Sheehy, *helper*; H. S. Mattimore, *page and preparator*.

BOTANY. Charles H. Peck, *state botanist*.

ENTOMOLOGY. Ephraim Porter Felt, *state entomologist*; Charles H. Walker, *entomologist's assistant*; D. B. Young, *entomologist's assistant*; George W. V. Spellacy, *page*.

ETHNOLOGY. Rev. W. M. Beauchamp, *author of bulletins*.

Historic and structural geology. An introductory collection, about 300 specimens, is arranged to illustrate geologic terms and definitions; a systematic collection, about 3000 specimens of rocks arranged in ascending series, with explanatory labels and maps showing distribution, represent the geology of the state. There is also a collection containing 3000 specimens mostly collected by the older geologists of the state survey. This contains many large coral masses and slabs of fossiliferous rocks. A number of large specimens illustrate various structural features.

A good series of relief maps constitute a prominent feature of the museum. It includes the following models: southern New England, scale 2 miles to the inch; New York city and vicinity, scale 1 mile to the inch; Manhattan island, scale 1000 feet to the inch, showing the present street system and the roads and topography as they existed in 1776; Manhattan island, scale 1000 feet to the inch, colored to show the geology; Catskill mountains, scale 1 mile to the inch, showing the exact proportion between elevation and distance; Adirondack mountains, scale 1 mile to the inch; Syracuse and vicinity, scale 1 mile to the inch; Niagara gorge and vicinity, scale 500 feet to one inch.

Lithology. The collections are large but are mostly stored for want of exhibition room. The exhibition material includes: the Rosenbusch collection of massive rocks, 500 specimens; 100 specimens of foreign and domestic marbles and a series of rocks from the crystalline areas of the state.

Collections of the rocks of the state and of New Hampshire, the Rohn collection of rocks of the Lake Superior region and a series of sandstones and crystalline rocks of Pennsylvania are in storage.

Economic geology. There are very complete series of the state collections on exhibition.

75 12-inch dressed cubes constitute the main exhibit of building stones. There are also columns, slabs, etc. of marbles and granites and a large number of specimens of extralimital material, principally of such stones as are of commercial importance in the state.

The iron ore collection includes a series of large masses of magnetite, hematite, limonite and siderite from mines which

have been extensively worked, also very complete series of smaller specimens. The nonmetallic minerals are shown in a series of large cases and include very complete series of New York salt with supplementary material from England, Germany, and other salt-producing localities. Gypsum, lime, cements, quartz, feldspar, garnet, corundum, graphite and all other minerals of the state are exhibited in series from the crude material to the manufactured product. A series of New York state oils and specimens of the oil-bearing rocks and sands are shown. A large collection of clays and clay products fills all the space which can be devoted to it.

Paleontology. 1,000,000 specimens, mostly Paleozoic invertebrates derived from the New York formations; including upward of 5000 type and figured specimens which have been used in the publications on New York paleontology; also many unique specimens of Paleozoic fish. Most of the fossils are in boxes and drawers in the State Hall, not many on exhibition but all accessible to students. Fine slabs of medusae, crinoids, crustaceans and trails are here exhibited. The types are systematically arranged in the laboratory of the state paleontologist except for those on exhibition in Geological Hall.

In Geological Hall a series of 7000 typical specimens arranged stratigraphically to show the characteristic fauna of each formation. Although this collection has been made with special reference to New York, materials from outside have been freely used to complete the series up to and including the Carboniferous. A number of large Devonian trees and algae are exhibited and also slabs of trilobite, worm and reptilian tracks from various formations.

There is also a series of European Paleozoic invertebrates; a series of more recent invertebrates, largely European; the Cohoes mastodon (mounted); the Monroe mastodon (unmounted); a nearly complete skeleton of the Irish elk; a series of casts of large vertebrates and other vertebrate remains.

Mineralogy. 10,000 specimens, including the Gebhard, the Albany institute, the Emmons and the Kuntz collections. A systematic collection of 3000 specimens many of which are from the old iron and other mines of the state; an economic collec-

tion of 500 specimens; a crystallographic series and 800 specimens to illustrate special groups on exhibition. There is also a superb collection of hydrosilicates from Bergen Hill, N. J. and collections of meteorites and gem materials. Many duplicates for exchange.

Zoology. REPTILES. 37 species, 125 specimens as follows: alcoholic and mounted 101, casts 6, skeletons 7, skulls, etc. 11.

AMPHIBIA. 19 species, 92 specimens, alcoholic 86, casts 3, skeletons 3.

FISHES. 194 species, 1799 specimens, alcoholic 1737, mounted 18, casts 22, skeletons 12, teeth, jaws, etc. 10.

INVERTEBRATES. 250 species, 1786 specimens identified, a considerable number still unnamed. Besides these the museum possesses large collections of shells, including the Gould collection with 6000 species and some 60,000 specimens, a collection of shells from Mazatlan presented by Mr P. P. Carpenter, and a collection of New York shells specially rich in Unionidae.

The zoologic collections are mainly intended to represent the fauna of New York state.

Entomology. The Lintner memorial collection comprising some 4800 species, is specially rich in Noctuidae, and though not on exhibition, is open to students. Large additions are made yearly to the extensive biologic and systematic collections which are being arranged and classified as rapidly as means will permit. These are accessible only to specialists. There is a general exhibit of the more important insects affecting fruit trees, small fruits, garden crops and grains, comprising about 100 species and representing the various stages of each insects development together with its work so far as material permits. A special collection of species annoying or destructive about houses and those affecting stored products has been arranged along similar lines. A small collection of beneficial insects illustrates some of the more important of these forms and another of scale insects gives a good idea of the general appearance of members of this exceedingly destructive group. The forms injurious to forest and shade trees are well represented, the various stages and methods of work being illustrated in the two latter groups so far as possible. There is a special col-

lection of about 50 species illustrating the work of gall insects, and a general idea of the class Insecta may be gained from a small systematic collection of over 600 species and representing most of the important groups. In addition there are small collections in Denton tablets illustrating protective mimicry and some of our more beautiful native butterflies and moths, and a technical collection of 60 different articles illustrates the methods of collecting and preserving insects. Another collection representing the principal differences between the common, malarial and yellow fever mosquitos is on exhibition and small collections illustrating the species commonly occurring in spring, summer and fall and those of interest on account of unusual form, size or other characters are exhibited for the convenience of teachers and their pupils.

Botany. The space in Geological Hall assigned to the botanic department is on the second floor in the southern extension of the building. It is divided into two rooms. The front room is used for exhibition purposes and contains sections of the trunks of 75 of the trees native to New York, which are cut to show the vertical, transverse and tangential sections, one half of each section being polished and the other being left unfinished in order to give an idea of the appearance of the wood. There are also some specimens of historic interest and specimens showing various forms of injuries to trees and their natural repair. Photographs of trees and thin sections of their wood are exhibited in swinging frames, supported by upright standards; a collection of edible and poisonous mushrooms and an economic collection are shown in table cases. The rear room contains the office of the botanist, the library, the herbarium and workshop.

The herbarium contains about 9000 sheets of New York plants excluding fungi, 10,000 fungi and 25,000 sheets of extralimital species and duplicates.

Ethnology. A large collection of material pertaining almost entirely to the Indian tribes of the state, including masks, pottery, arrowheads, spearheads, amulets, scrapers, clothing, cradle frames, etc., is on exhibition on the fourth floor of the capitol.

The museum has also a fine collection of wampum belts.

New York university, University Heights. John J. Stevenson, *professor of geology*; Charles L. Bristol, *professor of biology*.

Paleontology. 16,000 specimens.

Mineralogy and lithology. 1500 minerals, rock-forming minerals and rocks.

Economic geology. 8000 specimens; coal, iron and oil are specially well represented. There are specimens from all known oil-producing localities and important illustrations of individual mines of gold, silver and copper.

Zoology. Large collections specially rich in Bermuda materials but only about 1000 specimens on exhibition.

Ethnology. Only a small part of the collection, about 500 specimens on exhibition. Most of the collections are at present in storage till room can be provided for their reception.

Niagara university museum, Niagara. The Rev. George J. Eckhardt, in charge; the Rev. J. A. Tracy and James F. Houlihan, *assistants*.

Paleontology. 2000 specimens. Also 40 typical specimens of the Clinton, Medina, Chemung and Niagara formations. About 200 specimens for exchange.

Mineralogy and economic geology. 400 specimens from New York, New Jersey, Colorado, California, Canada, Ireland and Italy divided into the following groups: quartz, feldspar, sandstones, limestones, carbon and metallic ores. About 50 specimens for exchange.

Lithology. Specimens from the Medina, Clinton, and Niagara formations.

Zoology. 130 specimens of native mammals, birds, reptiles, eggs and insects.

Botany. 300 specimens of native plants. There are also specimens in this department for exchange.

Ethnology and anthropology. About 60 emblems of worship and domestic articles; American, Chinese, Japanese and African; a few anatomic specimens. 100 numismatic specimens.

The museum will be glad to exchange fossils from the vicinity of Niagara for ethnologic and zoologic specimens.

Polytechnic institute museum, Brooklyn. Henry Sanger Snow in charge.

Paleontology. 1000 specimens: chiefly of Paleozoic age.

Mineralogy. 3000 specimens including what was formerly known as the Smith collection which is particularly rich in micas.

Economic geology. A series of ores, chiefly of silver, copper and iron.

Lithology. 500 specimens: series of plutonic and metamorphic rocks.

Zoology. 1000 specimens: chiefly shells and insects.

Ethnology. 100 implements of the stone and bronze ages.

Rensselaer polytechnic institute museum, Troy. The museum is under the direction of the trustees of the institute, and in charge of the instructors in the departments represented. John M. Clarke, *professor of geology and mineralogy.*

Paleontology. 1500 specimens adapted to purposes of instruction: chiefly from the Paleozoic rocks of New York and Pennsylvania with no type specimens, and largely the donations of Prof. James Hall.

Mineralogy. A collection of about 5000 selected minerals of great historic value, the choicest specimens of which constitute the students study collection.

Lithology. 3000 specimens: a very complete collection of recent volcanic rocks; a good series illustrating the structure of crystalline rocks; a series representing structural and dynamic phenomena; an economic collection of about 1500 specimens illustrating nonmetallic produces, metallic ores, and metallurgical processes and products.

Zoology. A collection of recent Mollusca comprising about 10,000 specimens; a small series of invertebrates and vertebrates for students' use; about 350 specimens of mounted birds, and a few mammals.

Botany. A general herbarium of 5000 plants; and about 300 specimens of woods.

Ethnology. Collection small.

St Lawrence university museum, Canton. William N. Logan, *curator*.

Paleontology. 1000 specimens consisting of fossil forms from nearly all geologic horizons between Cambrian and Pleistocene; also 100 specimens of ferns from the Coal Measures.

Mineralogy. 4000 specimens, the greater part arranged in cases; also 1500 specimens including 1000 polished marbles, granites, etc.; and 500 hand specimens including the United States museum educational series.

Geology. 300 specimens including clay stones, coals, glaciated stones, etc.

Zoology. 299 alcoholic specimens; 100 specimens of corals, sponges, etc.; also 500 conchological specimens, including a special collection of American unios. Small collections in entomology.

Botany. A small collection of ferns, woods, etc.

Ethnology. A small collection of arrows, pottery, and stone implements.

Syracuse university museum of natural history, Syracuse. James R. Day, *chancellor*; Charles W. Hargitt, *curator of biological museum*; Thomas C. Hopkins, *curator of geological museum*.

Paleontology. 1700 specimens: a series of 1000 specimens illustrating the paleontology of New York; a more general collection of 200 specimens; Ward's series of 500 specimens illustrating historic geology, including many casts of rarer specimens. Material for exchange.

Mineralogy. 5000 specimens; including a general collection of 250; the French collections of crystals and minerals 210; and the Cooper collection of 500 to 600 specimens of quartz and its varieties.

Economic geology. 300 specimens: ores and smelter products.

Lithology. 400 specimens: illustrating the principal types of igneous, sedimentary and metamorphic rocks.

Zoology. 1000 specimens: Mammalia, Reptilia, and Amphibia; a collection of birds, both mounted and unmounted; a series of fishes, illustrating the principal genera of the United States; collections of shells illustrating most of the principal families and genera.

Botany. 7200 specimens: a herbarium of phanerogams, including native forms and many from foreign localities.

Ethnology and anthropology. Indian implements and pottery; coins; a number of models, casts, and engraved tablets from ancient Egypt.

Union college natural history museum, Schenectady. James H. Stoller, *professor of biology and geology*, in charge.

Paleontology. 3000 specimens: fossils mostly from the Paleozoic formations of New York and the Carboniferous and Permian formations of Kansas and Nebraska; type specimens from the Permian of Kansas.

Mineralogy. The Wheatley collection of about 4000 specimens of general distribution; small collections aggregating 500 specimens from different parts of the United States.

Historic geology and lithology. 1500 specimens from various localities.

Zoology. 14,177 specimens: species, 25 mammals; 300 birds; 100 reptiles; 20 amphibians; 150 fishes; 50 alcoholic examples of mollusks; the Webster collection of worms, 1950 specimens; 375 insects; 400 crustaceans; 352 echinoderms; 125 corals; 60 sponges; 2270 mollusks and molluscoids; the Wheatley collection of shells, numbering 8000 specimens.

Botany. 10,000 specimens, many exotic, arranged according to Engler & Prantl's *Pflanzenfamilien*. The local collections are very complete, specially the ferns and their allies of Schenectady county. There is also a valuable collection, 2300 specimens of fungi, the gift of Mr J. B. Ellis.

University of Rochester, Rochester. H. L. Fairchild, *curator of geology*; Charles Wright Dodge, *curator of zoology*.

Paleontology. The collection contains about 8000 species of European fossils besides those from America, altogether represented by about 25,000 specimens. It is particularly rich in ammonites and Tertiary mollusks.

On top of the paleontologic cases, and on the walls above them, is a series of models representing in facsimile many of the most celebrated fossils. There are also a number of casts, including a megatherium, three species of Proboscidea, an armadillo, and

a colossal turtle; specimens of the cranium and tusks of *Elephas ganesa*, the skull of a mastodon, and skull of *Dinotherium*.

Mineralogy. 5000 specimens, classified and consecutively numbered according to Dana's *System of mineralogy*, representing a great majority of known mineral species, showing crystalline and amorphous forms of the mineral. The specimens are largely from European localities—the rich mining regions of Cornwall, Saxony and Hungary having furnished many of the choicest masses of ores and most brilliant crystals. Among the largest groups are the fluorites, the quartzes and the calcites. There are also special collections in illustration of crystallography and other structural and physical properties of minerals.

Economic geology. A new department, and divided into carbon minerals, ores, and building and ornamental stones.

Phenomenal geology. A large variety of material illustrating the phenomena of rock structure and formation, and many interesting points in dynamic and physical geology. Here are huge columns of basalt from the Giant's Causeway, and the Rhine valley; volcanic bombs from the extinct volcanos of central France; veins of the several kinds in larger rock masses; contorted and folded strata; metamorphosed rocks; jointed structure; "slickensides"; faults; flexible sandstone; glaciated rocks; rounded drift; ripple marks; impressions of rain drops; mud cracks, etc.; a large number of septaria, clay stones and other concretions.

Lithology. 3000 specimens classified according to Dana's *Manual of mineralogy and petrography*.

A large number of the specimens were collected by Prof. Ward from the localities where specific rocks were first described. Disposed in the drawers are special collections representing the geology of characteristic regions; among these are 150 specimens from Vesuvius, once in d'Archaic's cabinet, 180 from Tuscany, 100 from Mt Blanc, 120 from the Paris Basin, 80 from Saxony, 200 from central France, and several hundred collected by the state geological survey, representing the New York strata.

Zoology. 1000 specimens: considerable invertebrate material; South American mammals and birds; native fauna, and many typical forms of vertebrates in general.

Botany. The collection is for teaching rather than for illustrative purposes and consists largely of algae and fungi.

Ethnology. Considerable material not on exhibition, and not fully classified.

The museum includes the Ward collections in mineralogy, lithology, paleontology and phenomenal geology. These are the original collections of Prof. Henry A. Ward, and were accumulated by him through many years of labor and extensive travel in execution of a plan to create a complete museum of geology for use in teaching. The material thus successfully gathered was purchased in 1862 for the university, through the generosity of the citizens of Rochester, for the low price of \$20,000. At that time it was the largest and choicest geologic collection in America, including about 40,000 specimens, handsomely mounted and labeled, and probably remains today unsurpassed in proportion and quality by any similar collection.

This museum is open to the public, and offers to the people and the schools of western New York an exceptional opportunity for the study of the earth's structure and history.

Vassar college museum, Poughkeepsie. William B. Dwight, *curator*, in charge of museum.

Paleontology. 8150 specimens consisting of a general collection of 5000 specimens, including the skeleton of a mastodon, 9 feet high and 21 feet long over all, a skeleton of a moa; lecture room collection always accessible for study to students of the geologic classes; the Hall collection no. 3, with some subsequent additions, about 3000 specimens. In the general collection, the Carboniferous and the strata above it are represented the more fully, chiefly by European specimens. In the lecture room collection the representation is fairly equal for the various strata in that part of it covered by the original Hall collection. Among the recent additions are about 100 fine sections of American fossil Bryozoa, accompanied by a specimen of each species prepared by E. O. Ulrich and a set of about 50 species of fossil ostracoid Entomostraca.

Mineralogy. About 3000 specimens in the general collection representing about equally the principal groups of minerals, purchased soon after the founding of the college from Ward's establishment, together with more recent additions; also a lecture room collection of 500 specimens always accessible to students in mineralogy. The ores and varieties of quartz are the more fully represented; there are also a large number of specimens of small size illustrating various crystalline forms; there are sets representing the various varieties of physical properties in minerals, and full sets of glass and wooden models of crystal forms.

Lithology. 800 specimens of rocks, including a selected representative collection of 150 typical rocks donated by the United States geological survey. There are about 100 microscopic sections of different kinds of rocks.

Zoology. 25,090 specimens including Foraminifera, plaster models, 150; Foraminifera, actual models, 200; sponges, 100; corals, 400; echinoderms and crinoids, 300; mollusks, chiefly shells, 18,000; crustaceans, 300; insects, 600; fishes, batrachians and reptiles, 40; birds, mounted and skins, 2600; birds eggs, 800; birds nests, 150; mammals, 100; osteologic specimens and various models, 400; alcoholic specimens (miscellaneous), 800; zoologic microscopic slides, 200.

Botany. 1700 specimens including the Merrill collection of ferns (pressed), 1000 specimens; a collection of ferns from the Hawaiian islands, 100 specimens; a general herbarium, 1500 specimens; 100 specimens of plants in many cases with open flowers, finely preserved in alcohol.

An adjunct to the museum is the Eleanor conservatory, containing many valuable plants (at least 1500) representative of the leading families, with facilities for their study.

Ethnology and anthropology. About 770 specimens, including arrowheads from many of our states, 350 specimens; Erminie A. Smith collection of ethnologic specimens of the Zuni Indians, 200; Orton collection of South American ethnologic and archeologic specimens, including valuable pottery, an ancient Peruvian mummy and a very rare compressed human head from the

Amazon river, 120; other miscellaneous archeologic and ethnologic specimens, 100.

Specially valuable specimens are, the type specimens of Trudeau's tern; several birds collected by Audubon, one of which, the great auk, the rarest of birds, was the original of his great steel plate engraving of the auk; a male specimen of the Labrador duck; several characteristic and finely mounted bird groups; a very large collection of South American humming birds; two condors, one reputed to be the largest in the country; a fine pair of California vultures; several ivory-billed woodpeckers; two male resplendent trogons; a moa skeleton; a mounted gorilla of great size and a skeleton of a gorilla; a fine narwhal tusk; a mammoth tusk and scapula; a mastodon skeleton; a fine group of the fur seal, male, female and pup from the Pribyloff islands; a mounted tarpon; a plaster cast of an immense fossil armadillo (*Schistopleurum*); 3 skulls of *Titanotherium* from Nebraska; a complete series of teeth in jaws of fossil horses illustrative of the evolution of that animal from the lower Eocene to the Pleistocene, donated by Prof. H. F. Osborn; a series of paleontologic casts of vertebrates, prepared at the American museum of natural history; a remarkably perfect and fairly complete specimen of the mosasaur *Clidastes velox*, on a single slab of stone, 8 feet long, from the Cretaceous of Kansas; a set of 100 microscopic sections of bryozoans with accompanying specimens, prepared by E. O. Ulrich; a large set of Ziegler's embryologic models; a complete set of Reeve's *Iconica Conchologica*, and many other valuable conchological works, purchased with Witthaus's large and fine collection of molluscan shells and kept with them in the museum.

An annual fund of not less than \$850, \$100 of which comes from a legacy of J. P. Giraud jr and the balance from a fund established by the founder, Mr Vassar, is available for the purchase of new specimens.

Ward's natural science establishment (a commercial museum) Rochester. Frank A. Ward, *secretary and treasurer*; E. T. Iekes and H. L. Preston, in charge of the inorganic department; also a staff of 16 assistants in the various departments. This company is incorporated under the laws of New York, with a capital

of \$125,000. The object is "collecting, preparing, manufacturing and dealing in objects of natural history."

Paleontology. 150,000 specimens representing all the geologic periods, and from all parts of the world; 1024 casts of celebrated fossils, most of the originals of which are in the various royal museums of Europe; and 100 different models and charts.

Mineralogy. 160,000 specimens of minerals from all parts of the world; a collection of meteorites containing over 200 falls and more than 350 specimens; series of specimens illustrating systematic mineralogy, physical mineralogy, crystallography, etc.

Historic geology and lithology. 22,000 specimens, including series illustrating general petrology and physical, dynamic and stratigraphic geology; a special series of about 125 specimens from the typical localities of the New York formations; 26 relief maps and models (geologic and topographic) of the most interesting geologic regions of the United States and abroad; several models illustrating dynamic and structural geology.

Zoology. 137,000 specimens: mounted specimens, skins and skeletons of mammals, birds, reptiles, batrachians, and fishes; also human skeletons and many anatomic models, charts and diagrams for use in instructing classes; a general collection in invertebrate zoology of 125,000 specimens representing 3000 species; and a special collection of 750 specimens of sponges containing many unique and undescribed forms.

Botany. 74 models illustrating the anatomy of plants.

Ethnology and anthropology. 5826 specimens of articles of war, use, ceremony and adornment of ancient and modern races from all parts of the world; also a large series of mummies and aboriginal skulls and skeletons.

All specimens in the establishment are for sale.

West Point mineralogical and geological cabinet. Samuel E. Tillman, in charge of the museum, assisted by Capt. R. P. Davis, artillery corps, and Capt. S. G. Jones, 11th cavalry.

Paleontology. 9074 specimens. A fairly representative assortment of the various forms of invertebrates from the Cambrian to the present time. A good collection of the fossils from the Carboniferous. A fine collection of the Mesozoic and Tertiary

mollusks, originally exhibited at the Crystal palace exhibition in 1851, and afterward bought for the military academy. The collection of recent mollusks is quite full and the collection of modern corals, fair.

In the Mesozoic collection there are 112 fossil forms from the Solenhofen limestone, and 200 plant leaves from the Dakota Cretaceous, both typical and excellent.

Mineralogy. 4563 specimens. A fairly full assortment of the ores of the common metals, of the varieties of silica (quartz) and the various silicates and calcareous minerals—no particular locality. Groups best represented are the ores of the metals and quartz.

Lithology. 644 specimens. Nearly all the species of the plutonic, metamorphic and volcanic rocks, together with many of the sedimentary rocks, including some fine marbles. A fine collection of the rocks of New England (250 specimens). An educational series of rocks from the United States geological survey, (156 specimens).

Ethnology and anthropology. Small number of implements of the Stone Age, and a small number of specimens of Indian pottery (Pueblo).

The museum also contains about 1200 unique or rare minerals, rocks and fossils not mentioned above including some large ammonites in section; some fine specimens of elephants' and mastodons' teeth, (Quaternary); a vertical section of the Coal Measures of Pennsylvania, with description; a vertical section of the Pennsylvania oil sands, with specimens of the sands and oils from different levels; plaster cast of American continents, with parts of Europe and Africa, and the bed of the Atlantic ocean; three exhibit collections of minerals, rocks and fossils for daily section room use, 1000 specimens each; a working collection of minerals, rocks and fossils for the same purpose, of 45,000 specimens (estimated from partial count). The cabinet also contains a set of crystal models, in glass and pasteboard (150).

NORTH CAROLINA

Davidson college museum, Davidson. J. M. Douglas in charge.

Paleontology. 3000 specimens. Paleozoic time is best represented, specially the Carboniferous system.

Mineralogy. 4000 specimens including the Brumley cabinet and the Oglethorpe university collection.

Historic geology and lithology. 2500 specimens particularly representative of the recent rocks.

Zoology. 800 specimens of shells.

North Carolina state museum, Raleigh. H. H. Brimley, *curator*; J. A. Holmes, *state geologist*; and T. K. Bruner, *secretary*.

Paleontology. Remains of marine and land vertebrates, including such striking forms as the mastodon, whales, sharks and other interesting forms, reptiles being particularly well represented.

Mineralogy. A systematic series of all the mineral species found in the state; a collection in crystallography; gem material and a very valuable collection of cut gems, including a specimen of diamond from Burke county; other native gems as ruby, sapphire, oriental topaz, cat's-eye, rhodolite, garnets, emerald, aquamarine, golden and opaque beryl; a lot of the semiprecious stones, and a small collection of meteorites.

Lithology. 500 specimens of the rocks of the state, arranged alphabetically by counties; 1000 specimens of rocks from which sections have been cut and samples analyzed.

Economic geology. A complete collection of the iron ores of the state, magnetite, hematite, limonite, siderite, pyrite; an exhaustive collection of gold, silver and copper ores in very wide variety; very full series of corundums and micas, talc, kaolins and other clays; granites, marbles and sandstones in systematic series showing both the finished and raw product; millstones; monazites in great variety, and zircons.

Zoology. The fauna of the state is well shown; a fairly complete series of the more conspicuous vertebrate forms including a 45 foot skeleton of *Balaena biscayensis*; fur-bearing animals; game birds and animals; birds eggs; a large series of reptiles and fishes; a full collection of economic fishes,

mounted and a fairly complete representation of the marine invertebrate fauna of the state.

Botany and forestry. A collection of about four hundred specimens of officinal plants of the state. In economic series are shown the timber trees of the state in finished and rough condition, illustrated profusely by enlarged photographs, also tree sections showing normal and abnormal growth.

Ethnology. A few cases of stone implements and pottery, and some human remains include the bulk shown. Considerable additions are in prospect in the near future.

This museum is an exhibit of the natural resources of North Carolina only. No effort is made to secure anything else, and the few outside specimens listed have been acquired incidentally. Plenty of room is given everything, and the cases are of the best known types for exhibiting the classes of specimens they contain. The capacity of the museum has been doubled at this date, three large exhibition halls having recently been completed. These will be filled along the lines mentioned. About 35,000 feet of floor space are occupied.

University of North Carolina, Chapel hill. No report.

NORTH DAKOTA

North Dakota agricultural college museum, Fargo. C. H. Hall, professor of geology, assisted by J. H. Shepperd, H. L. Bolley and E. F. Ladd.

Paleontology. A representative collection of fossils from Cambrian to Tertiary. Petrified wood and diatomaceous earth for exchange.

Mineralogy. 1000 labeled specimens.

Historic geology. A large collection specially illustrative of glacial phenomena with numerous models and charts.

Zoology. 150 well mounted birds of the northwest; 200 specimens of reptiles and fishes and other animal specimens for class reference, including quite an extensive display of bones illustrating the osteology of certain diseases in the horse.

Botany. An extensive herbarium of native plants of North Dakota; a full collection of the cultivated and native grasses of the state exhibited in large bunches for display of the roots, leaves, stems and fruit.

Material for exchange includes many species of the native plants and nearly complete series of the grasses of the state, mounted on herbarium sheets, or in bunches.

Ethnology. 50 relics of the American Indians; large collection of continental and other moneys.

Red River Valley university museum, Wahpeton. Edward P. Robertson, *president of the university*, in charge.

Paleontology. A few hundred specimens: series of fossils from the Silurian formations of New York; from the Carboniferous formations of Pennsylvania; and from the drift of North Dakota.

Mineralogy. Collection small and of general distribution.

Historic geology and lithology. A few hundred specimens illustrating various geologic formations: the lignite beds of North Dakota; the Ortonville syenite; and the geology of the Bad Lands of North Dakota.

Zoology. 100 specimens representing the classes of birds, reptiles, insects, etc.

Botany. 200 specimens illustrating the local flora. The herbarium is the result of field work of the botany class, and of private study.

Ethnology. 500 specimens confined to relics of the American Indians: some Arickaree pottery from the banks of the Missouri river; gleanings from various Sioux village sites; and some specially fine large milling stones, used by the Indians in making pemican.

State university of North Dakota museum, Grand Forks. M. A. Brannon, *department of biology*, and E. J. Babcock, *department of chemistry and geology*, in charge.

Paleontology. 1000 specimens, representing fossils of the various formations from the Cambrian upward, specially the Cretaceous, Laramie and Tertiary formations. Some material for exchange.

Mineralogy. 2000 specimens of wide distribution. The Black Hills of South Dakota is the district best represented. Large variety of clays of economic value and lignite coals for exchange.

Economic geology. 800 specimens, including clays and clay products of various kinds, coals, sandstones and soils.

Zoology. 299 specimens: 12 mammals; 7 skeletons of mammals; 120 birds; 40 fishes; 10 reptiles; 10 amphibians; 100 invertebrates. 30 duplicate specimens of birds for exchange.

Botany. 4640 specimens: herbariums of 1200 species of phanerogams; 100 species of fungi; 340 species of algae.

1000 duplicate phanerogams for exchange.

Ethnology. 650 specimens: 200 of weapons and wearing apparel of the American Indians; 15 of Mexican and oriental wearing apparel and ornaments; and 300 foreign and domestic coins. Few duplicates for exchange.

OHIO

Antioch college, Yellow Springs. W. E. Wells, *professor of biology*, in charge.

Paleontology. 10,000 specimens: 300 graptolites, from England, United States and Germany; 5000 specimens, United States Silurian; 1000 Devonian; 500 Carboniferous; 1000 of later formations.

Mineralogy. 500 specimens; educational collection of United States geological survey and some others; no one locality well represented.

Historic and economic geology and lithology. Silurian, Devonian and Carboniferous fauna; metalliferous and nonmetalliferous ores and their products; common rock-forming elements and compounds; fairly good series of rocks of earth crust.

Zoology. 4000 specimens: two mounted mammals; a few poorly mounted skeletons; eggs; common invertebrates for class demonstration; 500 insects, unarranged; 3000 shells, unnamed.

Botany. 600 specimens: several hundred sheets of pressed plants from this locality, gathered by students; small collection of mosses.

Ethnology and anthropology. 20 specimens: pottery of the Mound Builders and several human skeletons and remains without date, obtained from small caves along the cliffs of the Little Miami river.

Baldwin university museum, Berea. A. G. Rääb, *professor of natural science*, in charge.

Paleontology. 300 specimens, mostly Devonian and Carboniferous.

Mineralogy and geology. 500 specimens, including a general collection from the United States geological survey; specimens of the Berea, Cuyahoga and Bedford shales, mostly local, also specimens of the Berea grit with its numerous ripple markings. Could exchange specimens showing ripple markings, also cone-in-cone.

Historic and economic geology. Collections very small.

Zoology. 300 specimens mostly invertebrates.

Botany. Few specimens.

Case school of applied science, Cleveland. Frank M. Comstock, professor of natural history.

Paleontology. 7000 specimens: stratigraphic specimens, 576; zoologic, 1424; miscellaneous and unclassified material, 5000. Duplicates for exchange.

Mineralogy. 3000 specimens devoted to purposes of teaching, and not particularly complete in any group.

Historic and economic geology and lithology. 1854 specimens: illustrative of stratigraphic geology, 250 specimens; geologic phenomena, 200; an economic collection of 700; a collection of 800 illustrating the lithologic character of rock. Some duplicate material for exchange.

Zoology. 9651 specimens (3400 catalogued numbers): mammals, 80 mounted specimens; alcoholic specimens, 19; miscellaneous, 23; birds, 350 mounted specimens, 492 skins, and 630 nests and eggs; reptiles and batrachians, 229 alcoholic specimens; fishes, 224 alcoholic specimens; mollusks, 715 species in alcohol; Arthropoda, 380 species in alcohol; other invertebrates, 276 species in alcohol.

The above are catalogue numbers and include in many cases several specimens under one number. Duplicates for exchange.

Botany. 2724 varieties, illustrated by 3719 mounted specimens chiefly of the flora of Ohio. 1000 duplicate specimens, and exchange material.

Cincinnati society of natural history, Cincinnati. Joshua Lindahl, director.

Paleontology. 4882 specimens: a large general collection of fossils from North America and Europe; a practically complete collection of the fossils of the vicinity of Cincinnati; the Paul

Mohr collection of fossils, the greater part of which is not on exhibition on account of lack of space; and the most perfect pair of cores of horns of *Bison latifrons* in existence.

Mineralogy. 1296 specimens of general distribution.

Lithology. 734 specimens.

Zoology. Mammals, 150 species; including 37 species of *Quadrumania*; birds, 450 species, 1450 specimens, 220 sets of eggs, and 102 nests. Reptiles 103 species viz: *Ophidia* 43, *Lacertilia* 26, *Chelonia* 31, *Crocodylia* 3, and *Batrachia caudate* 35 species, 627 specimens, other batrachians not indexed. Fishes 391 species. Mollusca about 3000 species, of which only the *Naiades* have as yet been completely indexed 389 species, recognized in Simpson's *Synopsis*, 1497 catalogue entries. The balance of the collection, though mostly classified and much of it displayed in glass cases, has not as yet been indexed.

Botany. A mounted herbarium containing about 4000 species, an unassorted collection of about 10,000 unmounted specimens of woods, nuts, cones, etc.

Ethnology. The ethnologic collections of the society have, for lack of space in the museum, been deposited for the present time in the art museum in Eden park, with the only exception of the prehistoric Indian relics from the Cincinnati region. Of these there are 122 skulls, and two large cases filled with specimens from the so-called "prehistoric cemetery" at Madisonville, Hamilton county, just outside the city limits of Cincinnati.

Cuvier club of Cincinnati, Cincinnati. Charles Dury, *custodian of the collections.*

An organization for the protection of fish and game. The society possesses collections of birds and fishes, chiefly of the local fauna, and a library devoted to these subjects.

Heidelberg university, Tiffin. M. E. Kleckner, *professor of geology and biology, and acting professor of chemistry and physics.*

Paleontology. Material from the Silurian. Some specially fine cephalopods, Devonian, Carboniferous, Cretaceous, Tertiary and Quaternary systems; 100 plaster casts of fossils, including a megatherium and a mastodon skull.

Mineralogy. A fair presentation of the science.

Economic geology. 500 specimens: important varieties of ores, iron, copper, lead, zinc, gold, silver and antimony.

Zoology. 100 well mounted mammals and birds. Marine and fresh-water shells.

Ethnology. A few relics of the American Indians and the Mound Builders.

Hiram college museum, Hiram. George H. Colton, *professor of natural science.*

Paleontology. 1000 specimens: Paleozoic time is the best represented, but there is some material of later age.

Mineralogy. 1200 specimens: the more common minerals and ores from various localities.

Economic geology. 100 specimens: collections of building stones and fire clays.

Zoology. 1000 specimens: a collection of birds; shells from the Hawaiian islands.

Botany. A small herbarium and a small number of woods.

Ethnology. 2000 specimens: Indian relics from the neighborhood; some implements, war clubs, etc. from the South Sea islands.

Oberlin college museum, Oberlin. Albert A. Wright, *curator*, Lynds Jones, *assistant curator.*

Paleontology. 5700 trays of specimens, each containing from 1 to 50 individual specimens. This includes 4000 trays of Paleozoic fossils, one half of which are from the Carboniferous formations; a fine series of fossil fishes from the Upper Devonian formations, including type specimens of *Mylostoma*, *Titanichthys*, *Dinichthys*, etc.; numerous bones of *Camarasaurus supremus* Cope, from Canyon City Col.; a mastodon skull and tusks from Loraine county, O.; a series of 400 trays of Mesozoic fossils; 650 trays of Tertiary forms; and 300 of Pleistocene fossils from southern California.

Mineralogy. 2950 trays of specimens of general distribution; also a set of 900 trays for laboratory use.

Historic geology. General series of 1500 trays of specimens; a series of 2200 trays illustrating geologic phenomena.

Economic geology. 800 trays.

Lithology. 1200 trays of specimens; 4000 trays illustrating the varieties of rocks that are represented by the glacial boulders of the vicinity; a set of 300 glacial boulders approximately matched with the Ohio and Canadian rocks from which they were derived.

Zoology. 20,000 specimens: 60 mounted skins of mammals; 600 mounted skins of birds, and 1500 unmounted; 150 varieties of birds eggs in sets; 230 mounted and alcoholic specimens of reptiles; a complete set of the local fishes, 89 species, and a general collection of 580 mounted and alcoholic examples of fishes; 50 mounted skeletons and skulls of vertebrates; 5000 mounted insects; 4000 species of mollusks and other shells; and many hundreds of specimens of other invertebrates. Duplicates for exchange, particularly in the conchological collection.

Botany. 35,000 specimens: 15,000 specimens of phanerogams; 5000 of fungi; and an extensive series of United States lichens, mosses and algae. 15,000 duplicates for exchange.

Ethnology. 3500 specimens: representative collections of Japanese armor, weapons, apparel, etc.; Siamese utensils and apparel; weapons and apparel of the Dakota Indians; 45 specimens of Eskimo implements; Pacific islanders arms, utensils, mats, and apparel; south African weapons, apparel, and utensils; and a very complete collection (2000 specimens) of relics of the American Indians from both the east and west coasts of the United States. Several hundred articles from southeast Africa for exchange.

There are also in the museum various collections of historic interest.

Ohio state university museums, Columbus. J. A. Bownocker, *curator of geologic museum*; Herbert Osborn, *curator of zoologic and entomologic museums*; James S. Hine, *assistant in charge of zoologic and entomologic museum*; W. A. Kellerman, *curator of botanical museum*; W. C. Mills, *curator and librarian of archeologic museum*; Pearl Contillier, *assistant in archeologic museum*.

Paleontology. 9000 specimens; the formations best represented are the Hudson, Niagara, Carboniferous and Coal Measures; valuable collections of fishes from the Carboniferous limestone and Ohio shales; the collection is also rich in Coal Measures flora.

Much material for exchange from the Hudson, Niagara, Corniferous and Coal Measures.

Mineralogy. 500 specimens.

Economic geology and lithology. The economic museum contains about 2000 specimens illustrating Ohio material; in lithology there are about 500 specimens, including the Hawes collection from New Hampshire; the Williams collection from Baltimore; the Rohn collection from Lake Superior and the Krantz and Rosenbusch collections from Europe. Besides these the museum contains the Voigt and Hochgesang collections of thin sections of minerals and rocks.

Iron ores, building stones, coals and crude oils from Ohio for exchange.

Zoology. 25 mounted and 50 alcoholic specimens of mammals; 250 mounted specimens and 2500 skins of birds, mostly from North America; 100 jars of reptiles, 45 jars of batrachians, 289 jars of fishes, 96 jars of invertebrates, 300 skeletons, skulls and anatomic preparations; 3500 specimens of mollusks; and about 40,000 specimens of insects. Total number about 50,000 specimens. The Ohio fauna is well represented throughout the collection.

Entomologic specimens for exchange.

Botany. 3000 museum specimens, 80,000 herbarium specimens: a general herbarium of 30,000 mounted sheets; state herbarium of 20,000 mounted sheets of spermatophytes and pteridophytes; about 10,000 bryophytes and thallophytes; the W. A. Kellerman herbarium of 20,000 parasitic fungi; a museum consisting of 3000 specimens of 1) native trees of Ohio shown by sections of trunks, bark, slabs of wood, polished wood, twigs, leaves, flowers and fruit; 2) wood panels; 3) economic products; 4) medicinal plants of Ohio; 5) miscellaneous specimens.

Some herbarium specimens for exchange, principally fungi.

Ethnology and anthropology. 100,000 specimens representing archeologic material from every county in the state.

Archeologic material for exchange.

The museum also contains specimens of books printed in Ohio; specimens illustrating the settlement of Ohio and the Northwest territory.

All specimens collected by the geologic survey of Ohio are required by law to be placed in the charge of the state university.

Ohio Wesleyan university, Delaware. Edward L. Rice, *curator and in charge of collections of zoology and anthropology*; Lewis G. Westgate, *professor of geology, in charge of collections of geology, mineralogy, paleontology and botany.*

Paleontology. 5000 specimens including casts; the Devonian and Silurian formations are best represented; some good Devonian fishes; collection of 1000 Ward casts.

Mineralogy. About 2000 specimens.

Economic geology and lithology. About 1000 specimens.

Zoology. General collection, corals specially well represented; about 20,000 specimens of Mollusca, 500 of which are Unionidae. Total number of specimens 25,000.

Botany. About 300 specimens of woods.

Ethnology and anthropology. About 1200 specimens, mainly North American stone implements; including 500 choice and well selected specimens of the William Walker collection.

Lantern slides of geographic and geologic subjects and Ohio Corniferous fossils, specially corals, for exchange.

Otterbein university, Westerville. W. C. Whitney, *professor of biology and geology, in charge.*

Small working collections, of direct use in teaching, in nearly all lines but not for display.

Scio college, Scio. J. H. Beal in charge.

Mineralogy. 2000 to 3000 specimens.

Historic and economic geology and lithology. 500 to 800 specimens.

Zoology. 150 specimens.

Botany. 800 to 1000 specimens of American plants and woods.

Ethnology and anthropology. Small collection.

Specimens are distributed throughout the departments and in care of instructors using same.

University of Wooster, Wooster. No report.

Urbana university museum, Urbana. John H. Williams, *dean.*

Good general collections but not at present on exhibition.

Western Reserve University, Cleveland. F. H. Herrick, *curator of biology*; H. P. Cushing, *curator of geology*.

Paleontology. 6000 specimens: the S. G. Williams collection, mainly of New York Paleozoic, 2500; various small gifts and purchases; Silurian, Devonian and Eo-Carboniferous best represented.

Mineralogy. 2500 specimens: a very old collection obtained by purchase and by donations of Dr Kirtland and Col. Whittlesey; small and scattering recent additions.

Lithology. 1200 specimens mostly igneous rocks.

Zoology. 10,000 specimens: the R. K. Winslow collection of birds; the Kirtland society of natural history collection; private collection of the late Dr J. P. Kirtland; the general collection of Western Reserve university.

Botany. 1000 specimens: fairly complete collection of the Ohio flora.

OKLAHOMA

University of Oklahoma, Norman. Charles N. Gould, *curator*.

Museum collections destroyed by fire January 1902, new material is now being secured.

OREGON

Oregon state agricultural college museum, Corvallis. A. B. Cordley, *professor of zoology*, in charge of museum; W. T. Shaw, *assistant*.

Mineralogy. 1000 specimens.

Zoology. Small collection of Oregon mammals, Oregon birds and marine invertebrates.

Entomology. 75,000 specimens of Oregon insects, mostly Lepidoptera, Coleoptera, Hymenoptera, Diptera and Hemiptera.

Specimens of Coleoptera, Hemiptera, Diptera and Hymenoptera for exchange.

Botany. 8000 to 10,000 specimens of phanerogams and vascular cryptogams. 10,000 to 15,000 unclassified specimens. About 500 fungi, etc. About 10,000 to 15,000 specimens of Oregon and Washington phanerogams and vascular cryptogams for exchange.

Portland university, Portland. No report.

University of Oregon, Condon museum, Eugene. Thomas Condon, *professor of geology*; Chester Washburn, *assistant*.

Paleontology. 6000 specimens: the collection is principally Oregon material, it contains 500 specimens from the marine Tertiary of Oregon and the largest collection which has been made of Tertiary vertebrates from the John Day beds and other deposits of Eastern Oregon and type specimens including *Unio condoni* White, *Scalaria condoni* Dall, *Platygonus condoni* Marsh, *Anchitherium condoni* Leidy, *Oreodon superbis* Leidy, *Hippa eocensis* Washburn, *Hippa miocensis* Washburn.

Mineralogy. 800 specimens, general collection.

Economic geology and lithology. 900 specimens: collection of Oregon building and ornamental stones; ores of the Pacific Coast; metamorphic and igneous rocks of Oregon. Some material for exchange.

Zoology. 1000 specimens, collection of flowering plants and a private collection of fungi. A collection of Oregon woods for furniture, cabinet-making, etc.

Ethnology. 325 specimens, implements, etc., of Oregon Indian tribes.

Willamette university, Salem. No report.

PENNSYLVANIA

Academy of natural sciences of Philadelphia, including collections of the second geological survey of Pennsylvania, Philadelphia. Samuel G. Dixon *president*; Samuel G. Dixon, Henry C. Chapman, Henry A. Pilsbry, and Arthur Erwin Brown, *board of curators*; Witmer Stone, *assistant curator*; David McCadden, *taxidermist*; F. W. Wamsley, *preparator of marine animals*; Stewardson Brown, *conservator of botanic section*; Henry Skinner, *conservator of entomologic section*; H. A. Pilsbry, *special curator of conchology*; Witmer Stone, *ornithologic section*; Theodore D. Rand, *curator of the Vaux collection of minerals*; Rev. L. T. Chamberlain, *curator of the Lea collection of Eocene fossils*.

Paleontology. 45,000 specimens: the Lea collection of Eocene fossils, containing many type specimens described by Lea; the

Joseph Wilcox collection of Pliocene fossils; the Conrad and Gabb collections, containing many of Conrad's type specimens; an extensive collection of vertebrate fossils, among which are many of the types described by Cope and Leidy.

Mineralogy. 16,000 trays of specimens: large general collection; the William S. Vaux collection, specially endowed and constantly increasing—most of the specimens being exceptionally fine.

Historic geology and lithology. Several thousand specimens not at present arranged for exhibition.

Zoology. 1,059,400 specimens: 9000 mammals, representing species from all parts of the world, including mounted and unmounted skins and skeletons; one of the finest collections of birds in America, numbering 46,000 specimens; mounted and unmounted skins, including the type specimens described in Gould's *Birds of Australia*, as well as many described by Cassin, Townsend and others; 4400 jars of reptiles, including many type specimens described by Cope; 4000 specimen jars of fishes from all regions, including the Bonaparte collection; 850,000 specimens of mollusks, forming the largest collection in America, and including many type specimens described by Tryon, Lea, Say, Pilsbry, and others; 126,000 insects, including the Martindale collection of Lepidoptera; and the George H. Horn collection of Coleoptera. 20,000 specimens of other invertebrates, specially of crustaceans and echinoderms.

Botany. 200,000 specimens representing 40,000 species: collections of Nuttall, Read, Buchley, LeConte, Shortt and others; most of the series made by recent collectors in America; very large herbarium of old world plants; the Ellis and Everhart collection of fungi; the George A. Rex collection of Myxomycetes.

Ethnology. 10,000 specimens: a general collection; the Clarence B. Moore relics of the Florida and Georgia mound Indians; the Peary relief expedition collection from Greenland; the Halde-
man remains of North America Indians and native tribes of British Guiana; and the Morton collection of crania numbering 1100 specimens.

Exchanges made in all departments.

One room of the museum is devoted to the natural history of eastern Pennsylvania and New Jersey, and contains collections

in all departments of zoology, geology and mineralogy; also the Delaware valley ornithological club's collection of birds of that region, mounted with their nests and eggs, which attracts special attention.

Albright college, Myerstown. J. B. Stober, *professor of natural sciences and chemistry*, in charge of all collections, except those in anthropology, which are in charge of A. E. Gobble, *president*.

Paleontology. 700 specimens, chiefly from the Paleozoic formations.

Mineralogy. 775 specimens, including some typical specimens of silicates.

Geology. Iron ores from the state; a collection illustrating primordial metamorphism.

Zoology. 1300 specimens: marine invertebrates donated by the Smithsonian institution; recent shells and corals; labeled collection of fresh-water and marine fish; mounted specimens of the higher orders; and materials for class use in dissection and in lectures on comparative anatomy.

Botany. 500 specimens. 125 duplicates for exchange.

Ethnology. 300 specimens: historic relics, ancient and modern, coins; and relics of the American Indians.

Alleghany college, Meadville. J. H. Montgomery, *curator*.

Paleontology. Many specimens and a collection of Ward casts.

Mineralogy. About 10,000 specimens consisting of the Alger collection; the Prescott collection; and the Haldeman collection.

Historic and economic geology and lithology. Small collection, part of which was furnished by the United States national museum.

Zoology. About 100 mounted birds, a few specimens of animals in alcohol and 20 miscellaneous specimens mounted and unmounted. One fine mounted specimen of moose from Maine, the Prescott collection of shells, 5000 in number; also a set of shells from United States national museum.

Botany. Collection of local plants.

Ethnology and anthropology. About 100 specimens.

Boys central high school, Philadelphia. No report.

Bryn Mawr college, Bryn Mawr. Florence Bascom, *professor of geology*, in charge.

Paleontology. 700 species illustrated by 3500 specimens: chiefly invertebrate fossils, selected to cover geologic time from the Cambrian to recent, the Miocene species being the best represented.

Mineralogy. 950 specimens best representing Pennsylvania localities.

Lithology. 86 specimens and slides illustrating the geology of the Lake Superior region.

156 specimens and slides of the educational series of the United States geological survey, 14 specimens of the igneous rocks of Arkansas; 150 specimens from the Boston Basin and the Yellowstone national park; 60 specimens and slides from the Blanc massif, 100 specimens of eruptive rocks from the neighborhood of Christiania, Norway; 180 slides of the Rosenbusch igneous series; 28 specimens and slides of the Rosenbusch crystalline schist series and a full suite of the metamorphic rocks of Pennsylvania and Maryland.

Miss Bascom's private collection of 1450 specimens and 500 microscope slides illustrating foreign and American geology is accessible to students.

There are also biologic and ornithologic collections belonging to the college.

Bucknell college, Lewisburg. No report.

Carnegie museum, Schenley park, Pittsburg. W. J. Holland, *director*; staff includes 20 persons.

Paleontology. Large collections of vertebrate fossils made in Colorado, Wyoming, Nebraska and Montana. Specially rich in Dinosauria. Many types of species recently discovered. The best specimens of *Diplodocus* and *Brontosaurus* in existence. Large collections of invertebrates and fossil plants.

Mineralogy. 7000 specimens representing about 500 species.

Historic and economic geology and lithology. Considerable collections obtained by staff of museum and by purchase.

Zoology. 850,000 specimens. Mammals 550 species; birds 3000 species; fishes 300 species; reptiles 250 species; crustaceans 150 species; insects 72,000 species; mollusks 15,500 species;

marine invertebrates 420 species; about 45,000 species represented by types or paratypes.

Botany. 120,000 specimens representing 22,500 species. A fine series autographically labeled by the older American botanists.

Ethnology and anthropology. 6750 specimens. Collections representing the aboriginal tribes of North and South America, Africa and Asia and considerable collections from Egypt.

The museum publishes a series of octavo Annals and quarto Memoirs. Endowment, \$1,000,000.

Dickinson college, Carlisle. No report.

Geneva college museum, Beaverfalls.

Small general collection.

Haverford college museum, Haverford. H. S. Pratt, *professor of biology*, in charge.

Lithology. A small collection of rocks.

Zoology. 1075 native and foreign birds; 422 varieties of birds eggs; 4000 European beetles.

Botany. A collection of native and foreign plants.

Lafayette college, Easton. Frederick B. Peck, *professor of geology and mineralogy*, in charge.

Paleontology. A good working collection.

Mineralogy. 1000 specimens representative of the chief American and European localities. Minerals from Franklin Furnace N. J. for exchange.

Zoology. Fairly good representation of systematic zoology, together with a series of study collections for the use of students.

The museum was burned in 1898. New collections are now being made.

Botany. A large herbarium of the Pennsylvania flora, representing seven eighths of the North American species; many European, African, Indian, and Australian plants.

Lebanon Valley college, Annville. No report.

Lehigh university, South Bethlehem. See Addenda, p. 222.

Muhlenberg college, Allentown. W. R. Whitehouse in charge.

Paleontology. 600 specimens, representing the fauna of the various geologic periods.

Mineralogy. A general series of 500 representative specimens.

Lithology. 400 specimens: illustrative of the various formations of Pennsylvania; a partial series from Minnesota.

Zoology. 500 specimens, representative of the principal divisions of invertebrates, with a very few vertebrates.

Botany. 3000 specimens, mostly from Lehigh county, with some material from other localities.

Pennsylvania college, Gettysburg. E. S. Breidenbaugh, *curator*.

Mineralogy. 6000 specimens, general, representing most of the mineral species, and including a number of excellent crystals; 500 specimens in iron, copper and zinc metallurgy.

Lithology. 3000 specimens illustrating the general features of rock structures.

Botany. 6000 specimens: a general herbarium of eastern United States flora; some few varieties from Brazil.

There are no ethnologic collections.

Pennsylvania geological survey, Harrisburg. Collections deposited in the Academy of natural sciences of Philadelphia.

Paleontology. 2128 fossil invertebrates from Pennsylvania, ranging from the Potsdam sandstone through the Carboniferous formations; 549 fossil plants collected by Leo Lesquereux to illustrate the paleobotany of the coal formations of the state; 1248 specimens from Perry county, collected by E. W. Claypole, including 30 type specimens of invertebrates; and 293 Waverly and Chemung fossils, collected by F. A. Randall in the vicinity of Warren.

Mineralogy. 135 specimens collected by F. A. Genth, mostly from the southeastern part of the state.

Historic geology and lithology. 10,000 specimens: separate collections from sections across various counties and other portions of the state made by the survey members and arranged for exhibition accordingly; 146 specimens of glacial erratics collected in the state by H. C. Lewis; 1127 specimens collected by John F. Carll from the oil region, including a valuable series of sand pumpings and an economic collection of samples of crude petroleum from the various wells.

Pennsylvania military college, Chester. No report.

Pennsylvania state college, State College. The collections are not united as a museum, but each technical department has a collection which is in charge of the head of the department. M. E. Wadsworth, *professor of mining and geology*; N. W. Shed, *assistant in mining and metallurgy*; W. A. Buckhout, *professor of botany*; H. A. Surface, *professor of zoology*; H. P. Armsby, *professor of agriculture*; and G. G. Pond, *professor of chemistry*.

Paleontology. 2000 specimens: the Ward collection representing all geologic formations; Corniferous fossils from Columbus O.; specimens from the Cincinnati group of southeastern Indiana, from the Niagara group of Waldron Ind. and from the Subcarboniferous limestone of Indiana; fossil leaves from the Cretaceous formations of Dakota; material from the Trenton and Hudson river groups about State College Pa., and from the Coal Measures of Allegany Pa.

Mineralogy. 10,000 specimens: a large exhibition collection; a series illustrating physical properties, crystallization, etc., for the use of students.

Historic geology. A general stratigraphic series; the material collected by the first and second geologic surveys of Pennsylvania.

Lithology. A series of European rocks; rocks of the state; and a set of the United States geological survey collection of 200 rock types.

Economic geology. 5000 specimens: the Pennsylvania exhibit of ores, minerals and economic products at the World's Columbian exposition; a polyolith of 281 building stones of Pennsylvania and elsewhere; special collections of ores and ore-bearing rocks from Colorado and iron ores from the Lake Superior region; a general collection of economic minerals and rocks from Germany.

Zoology. 15,000 specimens: a general collection of 10,000 specimens; a special series of Pennsylvania vertebrates, a nearly complete representation; a special collection of insects showing their various stages of development and their work.

Botany. A herbarium of 4000 phanerogams, a series of 1500 species of seeds; specimens of woods of Pennsylvania from the state forestry exhibit at the World's Columbian exposition.

The Philadelphia museums, Philadelphia. William P. Wilson *director*; Gustave Niederlein, *chief of the scientific department*; Frederic Lewton, *curator of natural products*; Ernst Fahrig, *chief of laboratories*; George E. Lindin, S. Frank Aaron, Alexander MacElwee, Charles R. Toothaker, *assistants*.

The collections are almost exclusively economic, and are intended to represent in the best manner possible the commercial products and commerce of all countries of the world. They are at present classified under five principal heads: 1) materials of plant origin—including woods, fibers, tans, dyes, gums, resins, oil seeds, oils, coffees, drugs, tobaccos, grains, fruits, foods, herbariums, etc.; 2) materials of animal origin—wools, hairs, furs, skins, pelts, hides, food fishes, shellfish, silks, waxes, honeys, cochineal, sponges, pearl, etc.; 3) materials of inorganic origin—ores and metallurgic preparations, coals, petroleums, clays, coloring earths, salts, flints, sulfurs, building materials, etc.; 4) materials showing the habits and customs of nations—garments, ornaments, models of boats, carts, barrows, cars and other vehicles, utensils of domestic use, agricultural implements, weights, measures, legal forms and commercial headings, current money, games, weapons, musical instruments, etc.; 5) manufactured goods including articles imported by various countries except from the United States, articles made in various countries for home consumption, articles made in various countries for export.

The collections are rich in all departments and all told include about 250,000 specimens (estimated carefully). Particular mention should be made of the collections of foreign cabinet woods, fibers, gums and resins, grains, drugs, coffees, raw silks, raw wools and manufactured textiles, all of which are probably unsurpassed. A herbarium has recently been established which contains 7000 specimens and is growing rapidly. Mention should be made of a type collection of reptiles from Colombia, which includes some 13 new species described by the late Prof. Cope in a paper not yet published.

An extremely important department is the Commercial museum's bureau of information. Its primary object is to promote international trade, particularly the foreign commerce of the United States. To this end, it gives information of the

natural resources and raw products of all countries. It has thousands of correspondents in commercial centers of the world, and at frequent intervals sends members of its staff to the four quarters of the globe. This information thus secured is placed at the disposal of American business men, and the activity of the museum in this direction is a principal and very potent factor in the promotion of American trade abroad.

Swarthmore college museum, Swarthmore. Spencer Trotter of the department of biology in charge.

Mineralogy and geology. The Joseph Leidy collection of exceedingly choice cabinet specimens of crystallized minerals, characteristic rocks and ores, and transparent and opaque models of the various systems of crystallizations; the Robert R. Corson collection of stalactites, stalagmites and helictites, illustrating the limestone formations of the Luray caverns, the second in magnificence in the world; an educational series of rocks from the United States geological survey.

Zoology. The Wilcox and Farnum collection of mounted birds, including nearly all the species which inhabit, or visit, the state; a collection of several hundred bird skins for study and reference; a large series of partial and complete skeletons prepared at Ward's natural science establishment illustrating comparative osteology and the structure and framework of backboneed animals; the C. F. Parker collection of choice typical land, freshwater and marine shells; a large and constantly increasing collection of stuffed and alcoholic examples of vertebrates and invertebrates (including the United States fish commission educational collection); of dissected specimens for demonstration in lectures; glass and papier-maché models of invertebrates, and of special points in morphology.

Botany. 2000 specimens: the Eckfeldt herbarium illustrative of the flora of Pennsylvania.

Ethnology. The Frederick Kohl ethnologic collection, containing Indian implements, weapons, clothing, etc., mostly from Alaska; the North Greenland collection, deposited by Samuel J. Entrikin of the Peary expedition.

The collections of the college are strictly for use in teaching, the specimens being in constant use in the lectures and in the

laboratories. They are growing steadily, but always in the direction of rendering more perfect the means of illustrating the different branches of natural history, and with no intention of building up a collection of curiosities or miscellaneous articles.

Thiel college, Greenville. No report.

University of Pennsylvania, Philadelphia. Amos P. Brown, *professor of mineralogy and geology*; John M. Macfarlane, *professor of botany and director of the botanic garden*; Edwin G. Conklin, *professor of zoology*; and Stewart Culin in charge of the ethnologic collection.

Paleontology. 15,000 specimens: a series of fossils from the various Paleozoic formations of New York state, some of which are the type specimens described in the *Paleontology of New York*; Cretaceous fossils from the western states; Cenozoic and Mesozoic fossils from the Gulf and Atlantic coasts; many type specimens of the Galveston Tex. deep well fossils; various individual type specimens, and small collections; and a duplicate set of a part of the Paleozoic invertebrate fossils collected by the Pennsylvania geological survey. Monographic collections of certain groups are also included; as for example Bryozoa by Ulrich, and Ostracoda by Bassler.

Specimens from the Atlantic and Gulf coasts of Eocene, Miocene and Pliocene invertebrates in excellent condition, for exchange.

Mineralogy. 20,000 exhibited specimens and 5000 duplicates forming a nearly complete series of the known and recognized species of minerals. New York, New Jersey, Pennsylvania and North Carolina are specially well represented; Europe and the western states are also well represented. The collections of Dr F. A. Genth, Prof. E. D. Cope and Dr S. B. Howell, of the university, are included, also numerous donations, including the important Clay collection and about 100 duplicate specimens from the Bement collection. The recent purchase of the Cardeza collection of minerals of southeastern Pennsylvania and adjoining states has increased the collection by some 10,000 specimens. Dr Genth's corundum alterations are represented by a set of specimens.

Specimens from New York, New Jersey and the west and many local minerals for exchange.

Historic geology. Material illustrating the Paleozoic age generally, the Cretaceous of America, the general Mesozoic of Europe, and the Cenozoic of eastern America.

Economic geology. 2000 specimens: ores representing all of the principal western mining localities, specially those that were prominent 15 years ago; iron ores and coals from various parts of the United States.

Lithology. 2000 specimens of rocks illustrating the typical formations of America and Europe. Specimens of the local rocks, and ores from the west, chiefly gold and silver for exchange.

Zoology. 3000 vertebrates: material for a synoptic and comparative anatomic collection; the osteologic collection of the late Prof. Cope, including the Hyrtl collection of nearly 1000 beautifully prepared fish skeletons, which formed the basis of much of Prof. Hyrtl's studies on the osteology and of Prof. Cope's work on the classification of fishes; illustrations of local fauna; very complete collections of fishes; batrachians, lizards and birds from Pennsylvania, New Jersey, Jamaica, the Bahamas and the Grand Cayman.

10,000 specimens of invertebrates: a collection of many groups from the Bahamas and Jamaica obtained by the university expeditions of 1887 and 1890-91; the Leidy collection of parasites, including many types; the C. Pennock conchological collection; the Wheatley collection of the fresh-water mollusks of the world; and a large series of models and preparations illustrating the embryology and anatomy of both vertebrates and invertebrates. A vivarium containing living marine, fresh-water and land animals of almost every class.

Botany. A herbarium of 23,000 sheets: an extensive collection of alcoholic specimens for class use and 1200 alcoholic museum specimens illustrating comparative morphology; a set of the De Royle botanic models; and a botanic garden collection including 3200 species of living plants.

Ethnology and archeology. Five sections, each one of which is in charge of a curator.

The American section contains a very complete exhibit of antiquities from the cliff dwellings of Colorado presented by

Mrs Phere A. Hearst, and a similar exhaustive collection from Pachacamac, Peru, excavated by Dr Max Uhle and given by the late Dr William Pepper. These are displayed on two sides of the principal American hall. Lack of space prevents the public exhibition of other American collections, although the latter are available for purposes of study. They comprise a large and representative series of antiquities of the eastern United States, mound pottery and relics, and some 3000 American craniums; and are supplemented by extensive collections from existing tribes, notably a fine Eskimo collection from Point Barrow, Alaska, the gift of the Hon. John Wanamaker, and an extensive collection made during 1900-2, also at the expense of Mr Wanamaker. The Brinton library of works on American ethnology and linguistics, deposited by special arrangement with the university trustees in the museum library, greatly facilitates research in these departments. Mexico and Central America are represented by casts of monuments and valuable collections of pottery and stone implements.

The general ethnologic collections are contained in three halls, one of which is devoted to the Furness, Harrison and Hiller collections from Borneo. The same donors have recently presented a similar valuable series from the Naga Hills in Assam, and a representative series illustrating the life of the Ainos of Japan has recently been received from Mr Alfred C. Harrison and Dr H. M. Miller. Notable features of this section are comparative collections of musical instruments, fans and games, as well as a comprehensive collection of coins. Korea, China, Japan, Siam, Burma, Morocco and Russia are also represented by large exhibits.

The Babylonian and general Semitic section contains a large and extremely valuable collection of antiquities, the greater portion of which is the result of extensive excavations of the ruins of Nippur, in central Babylonia. Much time and labor have been expended in a thorough exploration of the principal mound of these ruins, which covers the temple of Bel, presumably the oldest sanctuary in Babylonia. Among the most important objects thus secured are about 35,000 cuneiform documents in clay. The Babylonian museum is the most important in America, and ranks immediately after the British

museum and the Louvre. The cuneiform documents of the fourth and second millennium B. C. can nowhere be studied to greater advantage. Hundreds of terra cotta and glass vases; Hebrew and Syriac bowls; about 700 fragments of the most ancient inscribed stone vases and votive tablets; nearly 600 seal cylinders; clay coffins; charms; a large amount of gold and silver jewelry, and other objects of art; all serve to illustrate the life and customs of the ancient inhabitants of Mesopotamia, and of the Semites in general. The committee in charge having, in 1898, obtained from the sultan a firman granting permission to continue its excavations at Nippur for a term of three years, and having raised \$30,000 for the purpose, deemed it expedient to concentrate its efforts on two seasons. The wisdom of this decision has been justified by the importance of the results. Foremost among these is the discovery of the library of the temple, from the ruins of which large numbers of precious ancient documents have been exhumed, and brought to the university where they will be published.

Under the reorganization of the department, which took place in 1899, the section of casts has ceased to exist. Already, in 1898, the committee had voted the funds at its disposal to the Egyptian and Mediterranean section for the purpose of securing some original ancient sculptures; and the casts acquired through its efforts were distributed and installed in the sections to which they respectively belonged. Thus the reproductions of important Central American monuments from Quiriguá and Copan may now be seen in the American section; while the great bas-reliefs of Trajan's arch at Benevento, and the important series of marbles found in the neighborhood of Lake Nemi on the site of a temple of Diana Arecina, form the most striking feature of the Greco-Roman hall in the Egyptian and Mediterranean section.

The Egyptian section has secured important series of objects illustrating the history, arts and industries of Egypt, from prehistoric times down to the Greco-Roman period. From the Egypt exploration fund, the American exploration society and the Egyptian research account, the committee in charge each year receives a fair share of the objects discovered.

In 1898 the museum was enriched by a fine seated Ka-statue of an Egyptian nobleman called Nenkheftek, who lived under the fifth dynasty, and whose tomb at Deshasheh was opened that year. With it have come the skeleton of the original and other valuable sepulchral deposits of the old Egyptian empire. From Behnesa an interesting collection of objects of the Roman period was obtained. The most important part of the acquisitions from this site, however, is a portion of the rich find of Greek papyri, which will eventually come to the museum.

In 1899 objects of inestimable value, dating from the earliest dynasties, were received from Hierakonpolis, among them being a superb alabaster vase inscribed in the name of King Kha-Sekhem, and 10 ivory carvings representing the men and women who inhabited the Nile valley about 4500 B. C. Interesting acquisitions from Dendera and Hu were also added.

In the years 1900-2 the work of the Egypt exploration fund proved of more than usual importance. Having obtained permission from the Egyptian government to go over the ground just excavated by a French syndicate at Abydos, Mr Petrie's finds and scientific results were of the utmost interest, the collections from this earliest stratum of Egyptian history having proved of peculiar value. Through the liberality of the American exploration society, which has assumed the financial responsibility involved in cooperating with the Egypt exploration fund on behalf of the department of archeology, a liberal share of the objects discovered will come to Philadelphia. Among these are a stele of King Qa, and several stone fragments and ivory tablets inscribed in the names of other and early successors of King Mena.

Of the founder of the United Egyptian Empire himself, an ebony tablet inscribed in his name may be seen, as well as other fragments and objects of his reign. Inscriptions and objects from the tombs of kings of the 1st, 2d, and 3d dynasties and even of pre-Menite rulers are among the new series. It is therefore fair to state that the collection, as far as regards the Archaic period, is unique in this country.

The Mediterranean collection comprises an important series from Cyprus and interesting Greek, Etruscan and Roman antiquities.

The excavation of some Etruscan tombs at Narce, Chiusi, Cervetrii, Vulci, Bizantium, Ascoli, Civita Castellana, Orvieto, Corneto and Tarantum, undertaken for this section, resulted in a splendid series containing a number of unique specimens.

Among these six Etruscan sarcophagi of stone representing the defunct reclining on his bier, excavated at Civita-Musarna, near Viterbo (third century B. C.) are a striking feature. These collections are the gift of the late Dr Pepper, of Mrs Hearst and the American exploration society and of the Hon. John Wanamaker. The Dillwyn Parrish collection has been enriched by a collection of demotic papyri, which will be added to its already important series of ancient manuscripts.

An expedition sent to Crete on behalf of the museum by the American exploration society, in the summer of 1901, under the direction of Miss H. A. Boyd and Miss Wheeler resulted in the discovery at Gournia of a Mycenaean town of about 1200 B. C. Paved and drained, albeit narrow streets, houses, a shrine and a palace were brought to view, and many objects of pottery, bronze, stone, etc. were discovered. A complete series of enlarged photographs illustrate in the museum this important discovery.

Two of the most valuable and interesting exhibits of the museum are deposited in the section of glyptics to which the western wing of the first floor of the Museum building is devoted. One consists of an exceedingly valuable collection of engraved gems and amulets presented to the university by Prof. Sommerville; the other a completely equipped Buddhist temple, also the gift of Prof. Sommerville.

The glyptic collection represents the life work of its donor, and covers epochs of gem engraving from the earliest eras to the present time. They are so arranged that visitors may, through the medium of these beautiful engraved stones, cylinders, seals and Gnostic tokens, inform themselves intelligently on the science which these gems of all epochs so notably exemplify.

A large number of objects from Buddhist temples, secured by the donor in his travels through the Orient, have been

arranged in the form of a Buddhist temple. This shrine contains gods, effigies, symbolic flowers, temple furniture, and fittings of every description secured from places of worship in almost every eastern country. During the winter months, Prof. Sommerville gives a series of public lectures on "Buddhism" in this unique temple on Sunday afternoons at 2.30 o'clock.

The collections are open to visitors daily, holidays excepted, from 10 a. m. to 5 p. m. On Sundays, they are open from 2 p. m. to 6 p. m.

For the prosecution of special studies in the museum, application should be made to the various curators in charge of the several sections.

Wagner free institute of science, Philadelphia. Thomas L. Montgomery, *actuary*; Thomas H. Montgomery jr, *director* of museum; Charles W. Johnson, *curator* of museum.

Paleontology. 20,000 specimens: a general collection arranged stratigraphically, specially rich in American Tertiary.

Mineralogy. 2000 specimens: a general and a local collection.

Zoology. 25,000 specimens: local, general and synoptic collections.

Botany. 1000 specimens: a local collection; a set of "Musci boreali-Americani" by Sullivant and Lesquereux.

Ethnology. The Clarence Bloomfield Moore collection of 1200 relics from the fresh-water shell mounds of the St Johns river valley, Florida; described in the *American naturalist*, 1892-93.

Free lectures are given at the Institute on the following subjects: chemistry, biology, geology, physics and engineering. Classes are formed in connection with the lectures, the institute providing the textbooks, and the museum furnishing material for study. The William Wagner reference collection of books on natural science is open to the public every day for reference purposes and there is a branch of the free library of Philadelphia in the building which furnishes books for home use.

Washington and Jefferson college, Washington. Edwin Linton, *professor of biology and geology*, in charge.

Paleontology. Collection contains several hundred exhibited specimens, and three or four times as many which are not yet

arranged. The collection is particularly rich in fossil plants of the upper Coal Measures.

Mineralogy. 2500 specimens: a general collection for purposes of illustration in lectures and class work; rich in silicifications from Colorado and ores of silver and copper from Tombstone Ariz.

Historic and economic geology. 1000 specimens: collections distributed from the United States geological survey and the second geologic survey of Pennsylvania; a series collected in Connecticut and Massachusetts; and specimens illustrating the formations of several mines belonging to the Anaconda mining company in Montana.

Zoology. 2000 specimens exclusive of duplicates: a systematic collection of the marine invertebrates and fishes of southern New England; tropical shells and corals; two collections of fresh-water shells; and a number of skeletons and other material for classroom illustration.

Botany. 500 specimens exclusive of duplicates: 110 species of phanerogams from northern India, 108 from Indiana and a number from Connecticut; an incomplete series of phanerogams and ferns from western Pennsylvania; 130 species of the mosses of western Pennsylvania collected and identified by Prof. Linn and Prof. Simonton of the college.

Ethnology. 800 specimens: material illustrating the industries, products and particularly the religious customs of the people of China, Japan, India, Siam, etc.; a collection from the tribes along the west coast of Africa; pottery etc. from Alaska and New Mexico.

Westminster college, New Wilmington. No report.

RHODE ISLAND

Brown university, Jenks museum of zoology, Providence. A. D. Mead, *curator*.

Paleontology. 10,000 specimens: a small general collection of fossils; an exhaustive series of the fossils from the Carboniferous formations of Rhode Island. Duplicates for exchange.

Mineralogy. A general collection of 5000 specimens. Material for exchange.

Historic geology and lithology. 500 specimens intended for class work.

Zoology. 25,000 specimens: general synoptic collections illustrating the various divisions of the animal kingdom; a series illustrating the geographic distribution of Rhode Island fauna. Duplicates for exchange.

Ethnology. 1000 specimens.

The museum includes the collection of the Rhode Island medical society.

Museum of natural history, Roger Williams Park, Providence. James M. Southwick, *curator*.

Paleontology. 750 specimens of general interest, including trilobites, crinoids, mollusks, fish and mammal remains; 70 specimens of plants from the Carboniferous rocks of the state.

Mineralogy. 1200 specimens illustrating 400 species and varieties: some excellent specimens, both European and American.

Historic geology. Collections chiefly illustrate the result of glacial action in Rhode Island.

Zoology. 6000 specimens: 250 species of sponges, corals and echinoderms; 1000 species of shells; 1200 species of insects; 30 species of fish; 25 species of reptiles; 500 species of birds and mammals; 125 species of eggs; the collection of mounted Rhode Island birds practically complete containing 292 species and 490 specimens.

Ethnology. 3000 specimens of Rhode Island aboriginal implements and 2000 specimens of implements from the United States and Canada; 40 specimens of dress of North American Indians; and a few implements from the South Sea islands.

There is a library of 950 books and pamphlets treating of the various objects in the museum, intended for study and reference, but not for general circulation.

Rhode Island college of agriculture and mechanic arts, Kingston. John H. Washburn, *president*.

Collections are as yet only small synoptic series for class use.

SOUTH CAROLINA

Clafin university, Orangeburg. W. J. Morrill, *director*.

Paleontology. 250 specimens: teeth and bones from phosphate rock.

Mineralogy. 3000 specimens: kaolinite, monazite sand and other South Carolina minerals.

Historic and economic geology and lithology. 300 specimens.

Zoology. 1500 specimens: mammals, birds, reptiles, shellfish, insects and lower forms. Coleoptera and Lepidoptera for exchange.

Botany. 1000 specimens: pressed plants and blocks of wood sections. South Carolina species of jessamine, azalea, dogwood, magnolia, long-leaf pine, etc. for exchange.

College of Charleston, Charleston. George H. Ashley, *curator and professor of biology and geology*, in charge.

Paleontology. 5000 specimens, including many types of fossils from phosphate beds, Tertiary invertebrates from Alabama, and a small collection from Europe and points in this country. The Tertiary is well represented. The museum has for exchange some shark's teeth from type localities.

Mineralogy. About 2000 specimens. Shepard collection of phosphate rocks, native and foreign; a collection of Russian minerals; Florida phosphates; Shepard general collection and small collections.

Economic and historic geology and lithology. About 200 or 300 specimens.

Zoology. About 7000 specimens. Mammals, mounted skins 200, one fourth of which are characteristic exotic species, and one fourth range in size from the camel to the Malay tapir; skeletons 125; birds, mounted skins 800, including a large and choice series of exotic forms, skeletons 50, eggs 250, nests 70; reptiles and amphibians, mounted skins 75, skeletons 20, in alcohol 95 jars; fishes, mounted skins 100, skeletons 20, in alcohol 115 jars; invertebrates, 5000; types of Audubon and Bachman's mammals. The museum has for exchange some specimens of mollusks, etc.

Botany. 5000. Elliott herbarium, rich in types; Ravanell herbarium; Biltmore herbarium and many others.

Ethnology and anthropology. About 500–1000 specimens. Casts of Assyrian, Egyptian, Grecian, Aztec, monumental art, mummy and cases; copies of Etruscan vases; between 500 and 1000 miscellaneous specimens, Indian, South Sea, African, etc.

The collections are now being rearranged.

Furman university, Greenville. W. F. Watson, *professor of chemistry and natural history*, in charge.

Paleontology. Collection small.

Mineralogy. A fair collection of the most common minerals from a great variety of localities; a limited number of good crystals.

Lithology. 300 specimens.

Zoology. A fine collection of stuffed mammals, birds and reptiles, known as the Marshall museum, of great value and very useful.

Ethnology. 100 specimens: implements and utensils of the American Indians.

South Carolina college, Columbia. F. C. Woodward, *president and professor of English*.

The college museum has twice been destroyed, so that the collections now are little more than what are needed for class use.

Wofford college, Spartanburg. No report.

SOUTH DAKOTA

South Dakota geological survey, Vermilion. James E. Todd, *state geologist*.

The collections made by this department are in the custody of the University of South Dakota, and are described with the other collections of that university.

State school of mines, Rapid City. Cleophas C. O'Harra, *professor of mineralogy and geology*, in charge.

Paleontology. 900 specimens: 300 Cretaceous fossils; 200 specimens (parts of vertebrates) from White River Bad Lands; 400 miscellaneous.

Mineralogy. 3000 specimens: mostly Black Hills minerals.

Historic and economic geology and lithology. 1200 specimens: ores and sedimentary, metamorphic and igneous rocks of the Black Hills region.

University of South Dakota, Vermilion. J. E. Todd, *professor of geology and mineralogy*; C. P. Lommen, *professor of biology*, in charge.

Paleontology. 1125 specimens representing 500 species: a general collection of 125 representing 50 species; 500 representing 300 species of the Paleozoic invertebrates; 350 representing 100 species of Mesozoic invertebrates, largely from Dakota; 200 representing about 50 species of the fossil vertebrates, mostly from the Miocene formations of Dakota; and a number of fossil vertebrates from other Tertiary formations.

Mineralogy. 700 specimens: a crystallographic collection of 250 specimens representing 100 species; a general collection of 400 specimens representing 250 species; and microscope slides of 150 species and varieties.

Economic geology. 150 specimens of nonmetallic and 250 metallic ores.

Lithology. A general collection of 300 specimens; a series of 150 of Ward's typical rocks.

There is also a collection illustrating stratigraphic geology.

Zoology. 900 specimens representing 843 species: an educational collection of 475 specimens representing 435 species, from the German exhibit at the World's Columbian exposition; 15 representing 11 species of Australian mammals; 19 representing 17 species of Australian birds; 130 specimens and species of North American fishes received from the Smithsonian institution; a series of 200 specimens and species of Dakota insects; and 500 microscope slides.

Botany. 1200 specimens representing 193 species: 43 models of different species of German fungi; a herbarium of 1000 specimens and species of the flora of Germany; and Dakota flora, numbering 157 specimens representing 150 species.

The collections of the state geological survey are included with those of this university.

Yankton college, Yankton. George A. Clark, *professor of biology*, in charge.

There are fairly good working collections in zoology, including typical specimens of all the subkingdoms; collections illustrating the local flora; and several cabinets of rocks and minerals.

These collections are not arranged for exhibition as a museum.

TENNÉSSEE

Carson and Newman college, Mossycreek. No report.

Cumberland university museum, Lebanon. James S. Waterhouse, *professor of chemistry and natural science*, in charge.

Paleontology. 1500 fossils of general distribution; a number of casts of famous fossils.

Geology and mineralogy. 600 specimens: a general study series. Also a collection of rocks furnished by the United States government.

Zoology. Small collections of dried and alcoholic specimens. A fine collection of Japanese shells, including 500 species with many duplicates.

Botany. Only a few specimens besides a good series of microscope slides.

Fisk university, Nashville.

Small general collection.

Zoology. 500 specimens.

Botany. 2000 specimens.

Small working collection of rocks and minerals.

Maryville college museum, Maryville. A. F. Gilman, *professor of chemistry and mineralogy*; M. E. Kennedy, *professor of biology, botany and geology*; Hugh R. Crawford, *assistant*.

Paleontology. 750 specimens: college collection of coal fossils, calamites, ferns, club mosses etc.; Black River corals; massive fossiliferous limestone; Bates collection of miscellaneous fossils; Webb collection of fossils of the Cincinnati period. About 100 Black River corals and fossils of the Cincinnati period for exchange.

Mineralogy. 1000 specimens: Dr F. Kantz collection of 200 specimens from Europe; college collection of 400 typical specimens from the United States; A. F. Gilman collection of 450 New England typical specimens; all classified according to Dana. About 100 duplicates for exchange.

Historic and economic geology and lithology. 200 specimens: United States government collection of 150 specimens of rocks of the United States; Keefe collection of choice specimens of Tennessee and Vermont marbles.

Zoology. 300 specimens: 100 birds eggs; Fisher collection of 150 alcoholic fishes of the United States; 100 dried specimens of echinoderms, corals, sponges, etc.

Botany. 478 specimens: Caulkins collection of 400 choice specimens of lichens of Tennessee; M. C. dendrology club's collection of 78 specimens of woods of natural growth on the campus.

Ethnology. 410 specimens: M. C. club of Japan collection of 150 specimens of Japanese books, weapons, garments, armor, household utensils, coins etc.; 20 Chinese articles, 50 Indian; 30 Persian; 150 Mound Builders relics; 10 American Indian specimens.

The museum also contains class flags, foreign flags and banners, some of the original scientific apparatus of the college, the first communion set brought into east Tennessee, the spinning wheel of the wife of the founder of the college, and a series of ancient books and manuscripts.

Milligan college, Milligan. No report.

Southern normal university, Huntingdon. No report.

Southwestern baptist university, Jackson. No report.

Southwestern presbyterian university, Clarksville. S. R. McKee, professor of chemistry, in charge.

Mineralogy. 6000 specimens prepared for inspection and study.

Lithology and paleontology. A large collection of rocks and fossils.

Zoology. 16,000 shells; on exhibition in the Stewart Cabinet building.

Botany. 500 mounted specimens.

University of Tennessee, Knoxville. Samuel M. Bain, *professor of botany*.

Paleontology. Small collection of casts and fossils.

Mineralogy. A small working collection.

Zoology. Several thousand insects and a small collection of alcoholic specimens of other animals.

Botany. 30,000 specimens including many types of Chapman, Gattinger, Scribner and others.

Duplicates for exchange.

Ethnology and anthropology. Small collection of Indian relics and casts of same.

Vanderbilt university, Nashville. L. C. Glenn, *professor of geology*, in charge; George W. Martin, *professor of biology*.

Paleontology. 15,000 specimens: Sturtz and Krantz collections; the Safford collection of Tennessee Paleozoic fossils and Mesozoic and Cenozoic fossils from Tennessee and Alabama; the Glenn collection of Atlantic coast Cenozoic invertebrates. Material for exchange.

Mineralogy. 4000 specimens: Sturtz and Krantz general collections.

Historic and economic geology and lithology. 2500 specimens: classic European and American rocks, both igneous and sedimentary; Tennessee Paleozoic rocks.

Some Tennessee rocks for exchange.

Zoology. 2000 specimens: the commoner forms of Tennessee and the south; both vertebrates and invertebrates; shells; some forms from the Woods Hole station. Material for exchange.

Botany. 5000 specimens: collections of lichens and algae. Material for exchange.

Ethnology and anthropology. 800 specimens: stone and bone articles and pottery from the Tennessee and Florida mounds.

Walden university, Nashville. Harold Steele, *professor of natural science*, in charge.

Paleontology. 100 specimens: material illustrating the fauna of the Lower Silurian formations in Tennessee, and of the Carboniferous formations of northern Illinois. A few brachiopods and corals for exchange.

Mineralogy. 400 specimens: a small general collection; a series of gold and silver ores from Colorado; and iron ores from Tennessee. A few Tennessee minerals for exchange.

Economic geology. 50 blocks of building stones of Tennessee, besides the material mentioned in the mineralogic collection.

Zoology. 1000 specimens: a series of the mammals, reptiles, batrachians, etc., of Tennessee; 116 mounted birds of general distribution; a study series of 400 birds illustrating the avifauna of Colorado and Tennessee; 50 sets of birds eggs; small collections of shells and stuffed fishes and 8000 insects.

Insects of all orders, birds, birds eggs and reptiles for exchange.

Botany. A herbarium of 300 specimens representing 150 species. 100 specimens for exchange.

Ethnology. 150 specimens from Africa, chiefly handiwork of some of the native tribes; a collection of coins and currency of various nations.

In the museum of the medical department of the college are collections of chemicals prepared by the students; crude drugs; and a series of pathologic specimens.

TEXAS

Howard Payne college, Brownwood. No report.

University of Texas, Austin. This university does not maintain a museum, but has collections in geology, biology, botany, etc., which are used for purposes of instruction. All books, collections, specially rich in new or recently described forms, both vertebrate and invertebrate, as well as in minerals illustrative of the resources of the state; and also apparatus and specimens belonging to the discontinued Geological survey of Texas authorized by an act of the state legislature have now been installed at the university, thus more than doubling its resources. Frederic W. Simonds, *professor of geology*; William M. Wheeler, *professor of zoology*; William B. Phillips, *professor of field and economic geology*; and William L. Bray, *adjunct professor of botany*.

Paleontology. American Paleozoic fossils; a series of Texas Cretaceous fossils, and Texas Tertiary fossils presented to the

university by George W. Brackenridge, a member of the board of regents.

Mineralogy. A general collection of specimens from all parts of the world; a series of typical crystals and a collection sent by the United States national museum.

Economic geology. A series of specimens illustrating the mineral resources of Texas; a collection illustrating the occurrence of lead and zinc in southwest Missouri.

Lithology. A general collection of rocks from all parts of the world; collections sent out by the United States national museum and by the United States geological survey; a set of rocks from the typical American localities, with slides for microscopic study.

Zoology. A complete set of the Leuckart and Niche zoologic wall charts; Brendel's and Ziegler's models; the Linnaea alcoholic preparations; several fine skeletons; and a local collection.

Botany. A herbarium of Texan plants, Kny botanical charts, and others hand painted.

Ethnology. The Swenson collection of coins and medals. A few years before his death, S. M. Swenson gave the university a valuable collection of coins and medals. Of the 3476 coins, 2217 are bronze, 1172 silver, and 87 gold. Many of these coins were in use before the Christian era, and, with few exceptions, none are of more recent date than the sixth century. Of the 1846 medals, 607 are silver and the remainder bronze and white metal, plated and gilt. There are 94 Russian medals, illustrating the rise and progress of that country from the time of Ruric to that of Czar Alexander. American, French, English and Swedish medals make up the remainder and illustrate historic events of great importance in these countries. Many of these coins and medals are rare, and their value in the study of history is great. Arrangement has been made to make this collection available for instruction in the university, and for this purpose it has been placed in charge of the professor of history, Dr George P. Garrison.

University of Texas mineral survey, Austin. William B. Phillips, *director*; Benjamin F. Hill, *assistant geologist*; H. W. Harper, *chemist*; O. H. Palm and S. H. Worrell, *assistant chemists*.

Paleontology. Collections specially rich in the fossil remains of the Carboniferous, Permian, Cretaceous and Tertiary.

Mineralogy and geology. Collections include ores of iron, copper, gold, silver, tin, lead, zinc, manganese, uranium and mercury. There has recently been added a complete set of crude oils found in the state and the products refined from them. There is a full set of the various types of rocks occurring in the state, including building and ornamental stones, some of them cut and polished. Asphalt, gypsum and salt horizons are well represented, as also materials for the manufacture of cement, tiles, sewer pipe, bricks, etc.

UTAH

University of Utah, Salt Lake City. R. H. Bradford, *curator*, in charge. This museum is for teaching purposes only, being supplemented by the collections of the Deseret museum at Salt Lake City.

Paleontology. 200 specimens: casts and models as purchased from dealers; miscellaneous collections of fossils.

Mineralogy. 2000 specimens: all the important groups in Dana's textbook.

Historic and economic geology and lithology. 500 specimens: models, charts, etc., and groups of specimens illustrating Tarr's *Economic geology of the United States*; United States government collection in lithology.

Zoology. 2000 specimens: mounted mammals, birds and reptiles; bird skins, alcoholic specimens.

Botany. 1200 dried plants of western United States; 500 European specimens.

Ethnology and anthropology. Scattered specimens.

VERMONT

Fairbanks museum of natural science, St Johnsbury. Delia I. Griffin, *director*; Mary E. Ide, *curator*.

Paleontology. Fossils from the various formations of the state, together with some casts of fossils.

Mineralogy. A small series of minerals and ores from the United States and abroad.

Lithology. A few hundred specimens, mostly from the United States.

Zoology. 4500 specimens: 36 species of mammals native to the state, some of which are mounted in groups to show their homes and habits, and a few from foreign countries; 700 North American and 1000 foreign birds, mounted, including 26 species of Paradiseidae; a small series of bird skins; 39 species of native and foreign reptiles and batrachians; 500 species of Lepidoptera and 1100 species of Coleoptera; and 1100 species of mollusks.

Botany. A herbarium of over 5000 specimens, chiefly phanerogams and vascular cryptogams, together with woods, fruits and grains.

Ethnology. Articles from the American Indians, Mexico, Egypt, South Africa, India, China, Japan, the Pacific islands, etc.

Numismatics and philately. A collection of 1500 ancient and modern coins, and over 2000 postage stamps.

The museum was erected, equipped and endowed by the late Franklin Fairbanks of St Johnsbury. It is free to the public and carries on an educational work in conjunction with the schools of the town.

Middlebury college, Middlebury. Edward A. Burt, *professor of natural history*, in charge.

Paleontology. The Adams collection, which is a general representation of the species from the different geologic formations; the Brainerd and Seely collection of fossils from the Champlain valley, which is particularly representative of the forms from the Chazy limestone. Additions to these collections have been made from several sources.

Mineralogy. A fairly complete set of minerals for the use of the classes.

Lithology. A set of the rocks of Vermont collected by Prof. Adams while conducting the geologic survey of the state; also a series of rocks of Minnesota.

Zoology. The Adams collection of shells, which includes the land and fresh-water shells of Vermont; a mounted collection of the native birds; and a marine collection, largely from the United States fish commission.

Botany. 2500 specimens: Brainerd collection of phanerogams and ferns of the Champlain valley said to lack about 50 species of comprising the full flora of the state; a set of Vermont mosses prepared by Dr Grout; 400 or 500 specimens of the basidiomycetous fungi of Vermont, now accumulating.

Ethnology and archeology. The Chapman collection of apparel and implements from the Yukon valley, Alaska; stone implements; several Assyrian tablets and casts, contributed by the Rev. Dr Farnsworth; and a series of relics of local and general historic interest.

The museum contains, primarily, collections illustrating the natural history of Vermont which have been made from time to time. They have been suitably arranged and cared for, so that they form an educational factor of value to the students.

University of Vermont, Burlington. George H. Perkins, *professor of natural history and curator of the museum*; L. R. Jones, *professor of botany*, in charge of the cryptogamic and local collections herbarium; C. G. Pringle, keeper of the herbarium, in charge of main herbarium; E. C. Jacobs, *professor of mineralogy*, in charge of the mineralogic collections. Student assistants are employed from year to year.

Paleontology. 5000 specimens particularly representative of Vermont formations: the Cambrian fauna from the Georgia slates and the red sandrock of western Vermont; the Calciferous fauna from various localities, including a nearly complete set of the Fort Cassin fossils described in bulletins of the American museum of natural history; the Trenton, Chazy and Black river fauna from various parts of the Champlain valley; and the Brandon lignites with carpolites, etc., from the Tertiary formations; specimens from America or Europe illustrating all the principal epochs.

Cambrian, Trenton and some Calciferous fossils for exchange.

Mineralogy. 5000 specimens: a good general collection of American and European minerals, including some very fine specimens; numerous specimens of Sicilian sulfur, celestite, etc., collected by the Hon. George P. Marsh.

Lithology. 2000 specimens: a series of the marbles and other metamorphic rocks of Vermont; a series of several hundred speci-

mens of the lavas of Vesuvius; and a large series of European rocks.

Zoology. 20,000 specimens: a series of the mammals of Vermont; a small series of skeletons and craniums of vertebrates; several hundred mounted birds, many of which are in their finest plumage, specially complete series of ducks, including a fine male specimen of the extinct Labrador duck; a collection of birds eggs; a series of mounted specimens of Lake Champlain fishes; a series of 6000 insects; a large collection of mollusks; and a considerable number of alcoholic specimens of reptiles, fishes, crustaceans and worms; a group of nine beavers from 6 weeks to 3 years of age, arranged to show the animal in its natural haunts, with a full sized section of a lodge, part of a feeding ground, 13 feet of a dam and a representation of a part of the pond. The materials were collected by Mr W. E. Balch of Lunenburg, in northern Maine, and the work has been done by him with the utmost fidelity to nature.

Botany. About 70,000 specimens; of these some 50,000 are the Pringle herbarium which represents pretty completely, for the vascular plants, the known flora of North America together with a majority of the European species and a good showing from other parts of the world. It is specially rich in Mexican specimens collected by Mr Pringle. The remainder of the collection consists largely of Vermont plants. It includes the herbariums of C. C. Frost and Joseph Torrey and an almost complete representation of the more recent collections of Gront, Eggleston and other Vermont botanists. The aim is to make the collection as broadly and completely representative of the Vermont flora as possible.

Vermont and Mexican specimens are available for exchange, chiefly ferns and seed plants.

Ethnology and archeology. 10,000 specimens: a large series of specimens illustrating Vermont archeology; collections of stone and earthenware utensils from the Mississippi valley, the Colorado cliff ruins, Central America and Peru; arms, implements, etc., from the Pacific islands, Australia and Africa; a very fine collection of Sioux weapons, articles of apparel and ornaments, etc.; an interesting collection of Japanese arms and

armor, and of English swords of the 16th and 17th centuries, halberds, guns, etc.; and a unique and superb collection of oriental (chiefly East Indian) carvings, embroideries, weapons, etc. which are exhibited in a room fitted up in oriental style—the walls hung with costly embroidered fabrics and furnished with carved teak wood. This collection is a recent legacy. There is also a very good collection of Greek and Roman coins and of modern medals and coins from most of the countries of the world, several thousand specimens in all.

In collecting and arranging the specimens the chief objects aimed at are to illustrate the lectures on natural history and so to make the museum a valuable adjunct of classroom work, and to illustrate the natural history of the state of Vermont.

Vermont state cabinet, Montpelier. George H. Perkins, *state geologist*, in charge. The museum is designed to be mainly local, illustrating in all its branches, the natural history of the state. It contains for the most part, Vermont specimens, though these are supplemented to some extent, by specimens of groups not found in the state, e. g. corals etc.

Paleontology. 500 specimens: a series of Cambrian fossils from Highgate and Georgia Vt., including fine examples of the Parker ledge, *Olenellus*, *Mesonacis*, etc.; a representative series of Calciferos (Fort Cassin), Chazy, Trenton and Utica fossils of western Vermont, Lake Champlain region; an extensive series of the *Carpolithes* etc. from the Tertiary Lignite of Brandon; also a nearly complete skeleton of *Delphinapterus leucas* (*Beluga vermontana*); two mastodon tusks nearly complete from the Champlain clay and other Quaternary fossils. The whole number on exhibition is not large because of lack of case room.

Mineralogy. 2000 specimens: a good collection of Vermont species, specially quartz, actinolite, calcite, ores of iron, lead, copper and manganese; also many other species less fully represented.

Historic and economic geology. 5000 specimens: a complete series of the rocks of Vermont collected by the survey of 1856-60; also a nearly complete set of marbles, slates and granites showing the rough and polished surfaces,

Zoology. 2000 specimens: a nearly complete set of the mammals and birds which are or within 50 years have been resident in the state; an alcoholic collection of reptiles and batrachians and a small collection of insects found in Vermont; a collection of several hundred Lepidoptera from other parts of New England and the tropics mounted on Denton tablets; also small but very good collections of corals and mollusks and 100 crania of mammals and birds.

Botany. 1500 specimens: a set of native plants collected and mounted by Mr C. G. Pringle.

Ethnology. 200 specimens: stone, copper and earthenware objects from various localities in the state.

VIRGINIA

Emory and Henry college, Emory. Small collections of rocks and minerals.

Roanoke college, Salem. No report.

State museum, Virginia military institute, Lexington. Hunter Pendleton, *professor of chemistry*, and N. B. Tucker, *professor of mineralogy and geology*, in charge.

Paleontology. 720 specimens collected from the various geologic formations; richest in fossil plants from the Coal Measures, and mollusks of the Tertiary system.

Mineralogy. 3525 specimens: a general collection of 2350 specimens; a fairly complete collection of 1175 Virginia minerals; minerals of the different counties of the state specially the tin, iron and manganese ores from Rockbridge and Augusta counties; also a series of gold and silver ores from the Cripplecreek, Aspen and Leadville districts of Colorado.

Lithology. 386 specimens: collection illustrating the metamorphic and igneous rocks of the Appalachian system; also collection of rocks illustrating: 1) unaltered sedimentary rock of mechanical origin; 2) unaltered sedimentary rocks of chemical origin; 3) unaltered sedimentary rocks of organic origin; 4) unaltered igneous rocks; 5) metamorphic sedimentary rocks; 6) metamorphic igneous rocks; 7) residual rocks.

Economic geology. Marbles and building stones; collections illustrating the products and byproducts of brine; dressed orna-

mental stones; products and byproducts of petroleum and mineral paints.

Zoology. 1500 specimens: molluscan shells, with a very few representatives of the other subkingdoms.

The museum also contains specimens illustrating tobacco from the crude leaf to various manufactured products; the manufacture of cotton and linen fabrics; various iron and steel products; oils and varnishes; artificial stones and stonework; silks and their dyestuffs; rubber in various stages of manufacture; fertilizers; products from the Rumford chemical works; powders, and other industrial products. There is also a series of 288 *materia medica* specimens.

University of Virginia, Lewis Brooks museum, Charlottesville. William M. Fontaine, *professor of natural history and geology*.

The museum has no staff apart from the professor teaching the subjects illustrated in it. Each professor has charge of his own department.

Paleontology. 8000 fossils illustrating the life of all formations, particularly forms from the Triassic, Jurassic and Cretaceous; a number of restorations, both life size and reduced, of large vertebrates, either entire or in part; and a number of plaster casts of famous fossils.

Mineralogy. 4000 specimens: a large general collection; series of specimens illustrating phenomena, color, structure and physical properties; a collection of models of meteorites; models of gold nuggets; imitation gems and a set of crystal models.

Historic geology and lithology. Lavas of Vesuvius; typical rocks from the Alps; a series of typical rocks of the New York formations, and from Auvergne, Paris Basin, Saxony and Virginia; an historic series from the different formations, and illustrative collections of igneous, metamorphic and fragmental rocks and a set of relief maps.

Economic geology. 4500 specimens: ores of Virginia; foreign (chiefly Italian) and domestic marbles, and a collection of building stones.

Zoology. 5000 specimens fully illustrating all the principal animal groups: mounted specimens; skeletons; alcoholic prepara-

tions; plaster models of many forms; enlarged models in wax of polyps, etc.; a large series of corals, dried specimens, etc.

Botany. 30,000 specimens: herbariums of Europe, North America, West Indies and Syria; collections of fruits and models of them; woods; dissected models of fruits and flowers; and pressed specimens of typical plants with engravings of their parts.

Ethnology and archeology. Collections very small.

The museum is composed of specimens intended strictly for illustrating the principles of the sciences taught, the aim being to give full representation of the natural objects. It is strictly a teachers museum.

Virginia polytechnic institute, Blacksburg. Ellison A. Smyth, in charge of natural history museum; John Spencer, *state veterinarian*, veterinary department; Robert C. Price, *mineralogy*; W. B. Alwood, *state entomologist*, in charge of fungi, scale insects, etc. in station building.

Mineralogy. 900 species: the various groups of ores (oxids, carbonates, sulfids, silicates, etc.); metals of economic value; minerals of industrial importance.

Historic and economic geology and lithology. 800 species: various classes of rocks and different formations; an educational series presented by the United States geological survey.

Zoology. 1200 North American bird skins; a small collection of mounted birds; shells, marine invertebrates, etc., sufficient to illustrate the work of the institute in zoology; on deposit for an indefinite time, 3500 species, 25,000 specimens, rich in the genus *Papilio* (236 species) and the *Sphingidae* (145 species) of native and exotic butterflies and moths; the station collection of native insects, rich in *Orthoptera* and *Coleoptera*, containing 4000 species and 10,000 specimens, 60 species being scale insects on 125 different host plants; 1000 histologic slides; 50 species of alcoholic snakes, lizards, etc.; skulls of alligator, turtle, porpoise, cat, dog, etc.; mounted skeletons of monkey, sheep, dog, cat, horse, cow, squirrel, birds, turtle, fish, etc.; a large lot of animal parasites in alcohol and microscopic specimens.

Lepidoptera for exchange.

Botany. 3000 species of *spermophyta* and ferns; 550 specimens of fungi; seeds of native weeds.

WASHINGTON

Ferry museum, Tacoma. Meriden S. Hill, *secretary*, in charge.

Paleontology. 150 specimens.

Mineralogy. 250 specimens.

Historic geology and lithology. 50 specimens.

Zoology. 50 specimens.

Ethnology. 200 specimens. Also large collections of paintings, etchings, engravings, photographs, old books, armor, coins, statuary, curios and articles of virtu.

State agricultural college, Pullman. C. V. Piper, *professor of botany and zoology*; Solon Shedd, *professor of geology and mineralogy*; R. H. Snodgrass, *assistant professor (entomology)*; H. S. Davis, *assistant in vertebrate zoology*; R. K. Beattie, *assistant*.

Paleontology. 1000 specimens, general study collection.

Mineralogy. 800 specimens.

Lithology. 600 rocks.

Zoology. 5000 specimens of mammals, birds, mollusks, echinoderms, etc. 100,000 insects. Insects and mollusks for exchange.

Botany. Herbarium contains 40,000 sheets of phanerogams and pteridophytes, 2500 bryophytes, 5000 fungi, 200 algae. Phanerogams, bryophytes and fungi for exchange.

Ethnology. 500 specimens stone implements, etc. There are also collections illustrating agriculture, horticulture and veterinary science, pathologic and anatomic specimens.

Tacoma academy of science, Tacoma. Museum in charge of the secretary, Meriden S. Hill, who is also secretary of the Ferry museum.

Geology. 500 specimens.

Ethnology. 1000 specimens.

University of Washington museum, Seattle. Henry Landes, *state geologist*, in charge.

Paleontology. 2000 specimens of invertebrate fossils from Silurian formations; 1500 specimens of miscellaneous material derived from various sources, including the skull of an Alaska bison, etc. Specimens of Cretaceous and Tertiary invertebrates and plants from the Coal series for exchange.

Mineralogy. 4000 specimens of Washington minerals, arranged according to Dana.

Economic and historic geology. 2000 specimens of ores of gold and silver; other ores, such as iron, copper, lead etc., 600; minerals, 2500; coals, including all varieties, 100; building stones and clays, 50; 300 specimens illustrative of the state's geology.

Zoology. Small collection of mounted mammals, mostly local species; considerable collection of mounted birds, mostly indigenous species or from Alaska; 100 specimens of mounted fishes; fairly complete series of the marine invertebrates of Puget sound, specially Mollusca and Echinodermata; miscellaneous collection of marine invertebrates from various parts of the Pacific coast and elsewhere; a collection of many thousands of insects. Limited number of specimens for exchange.

Botany. 4000 specimens from Washington; 500 from Michigan; 2000 from Alaska.

Ethnology and anthropology. Material collected by the state for exhibition at the World's Columbian exposition and afterward donated to the museum. It illustrates the industrial life of the local Indian tribes.

Vashon college, Burton. No report.

WEST VIRGINIA

West Virginia university, Morgantown. S. B. Brown, *curator*.

Paleontology. 2000 specimens: 500 genera, 700 species; coal plants and other Carboniferous fossils well represented; the original fossil plants from which the plates in the volume on the Permian flora of Pennsylvania were made.

Mineralogy. 1300 specimens, 400 mineral species. Economic minerals well represented.

Historic and economic geology and lithology. 500 specimens: building stones and mining exhibits.

Zoology. Working collections.

Botany. 3000 specimens: mainly the flora of West Virginia.

Ethnology and anthropology. 500 specimens: ancient stone weapons and utensils.

WISCONSIN

Beloit college, Logan museum, Beloit. George L. Collie, *curator*.

Paleontology. 1500 specimens including fossils from all the geologic periods. The Trenton group is well represented, as a fine section of the Trenton limestone is exposed at Beloit, and the collection contains many type specimens from these strata. The Mesozoic formations are also well represented by European forms, mainly ammonites; the Tertiary by European forms. Many specimens from the Trenton group for exchange; also material from the Mesozoic and Tertiary of Europe.

Mineralogy. 600 specimens designed to illustrate as fully as possible Dana's *Textbook of mineralogy*, and particularly rich in quartz and calcite, mainly from Wisconsin. Calcite is the only material offered for exchange.

Historic geology. Ward's series of typical specimens from New York state.

Lithology. The series of specimens issued by Krantz of Bonn illustrating Rosenbusch's *Manual*, and that issued by Sturtz of Bonn, illustrating the typical massive rocks; also a series issued by Kuntze of Iowa City illustrating typical American localities has been added recently.

Economic geology. 800 specimens: a series of specimens illustrating the chief ore bodies of the west; a large collection of ores obtained from the World's Columbian exposition, illustrating the occurrences in Australia, Canada and Turkey. Many duplicates of ores from various parts of the world for exchange.

Zoology. The Williard zoologic collection of 1000 specimens, representative of the birds, and to a less extent of the mammals of Wisconsin; 200 species of birds eggs in storage; and a large collection of shells not well labeled. Many bird skins for exchange.

Botany. 1500 specimens: a herbarium of Wisconsin flowering plants; the Ellis collection of fungi.

Ethnology. 2500 specimens: a large number of mortars and pestles, and mealing stones; Mound Builders and modern Mexican pottery; aboriginal tools, spear and arrowheads, among which are many obsidian pieces; numerous articles of adornment, pipes,

war clubs, hammers, axes, etc., a few copper implements, including two Aztec copper bells; Indian clothing and implements; some bone implements from remains of the Lake Dwellers, and stone and bronze implements from European localities; also a collection of 3500 coins and 112 casts of antique Grecian sculpture.

On the exchange list are arrow and spearheads from various localities, obsidian flakes from Mexico, perforated stones from South Africa, pottery from New Mexico and Arizona, broken pottery, etc. from the shell mounds of Japan, and Cliff Dwellers pottery.

The museum also possesses a large collection of postage stamps.

Lawrence university museum, Appleton. D. P. Nicholson in charge.

Paleontology. Small collection of fossils representing the Devonian, Silurian and Ordovician.

Mineralogy. Fair working collection of minerals and rocks.

Geology. A duplicate set of the collections made by the state geological survey of 1879 and some succeeding years.

Zoology. 150 mounted animals and bird skins, and a set of shells, all collected by Dr J. J. Brown of Sheboygan, and amounting to several hundred species with a considerable number of duplicates.

Ethnology and anthropology. Collection of miscellaneous curios.

Milton college museum, Milton. Ludwig Kumlien is in charge of the museum, except the ethnologic collections, which belong to Willis P. Clarke.

Paleontology, mineralogy and geology. 4000 specimens not well arranged and grouped, of a wide distribution, though Wisconsin is best represented.

Zoology. 30 mounted specimens of as many species of Wisconsin mammals; 400 mounted specimens of Wisconsin birds; 200 specimens, mostly alcoholic, of Wisconsin reptiles, amphibians and fish; 500 alcoholic specimens of marine invertebrates, and 2000 insects. A private collection of more than 6000 skins of animals and birds, also one of the eggs of 500 different species

of birds, are accessible to the students. Bird skins, birds eggs, and Wisconsin mammals for exchange.

Botany. A herbarium of 2000 species, nearly all Wisconsin forms, and mostly from Rock county; 200 to 300 mounted specimens of arctic algae and lichens.

Ethnology. A private collection, general in scope, of several thousand specimens, but more representative of the Wisconsin Mound Builders than of any other people or time.

The museum is for the purpose of giving to students an opportunity to study, as far as is possible, the entire range of natural science, and contains various skeletons, preparations, etc., not enumerated above. The mounted specimens are mostly local, except the private collections mentioned.

Milwaukee public museum, Milwaukee. Henry L. Ward, *custodian and secretary*; Carl Thal, *assistant custodian and assistant secretary*; William B. Brickner, *special clerk*; Charles Brandler and George Shrosbree, *taxidermists*; John F. Fidlin and Paul C. Rohde, *taxidermist apprentices*; Herbert Clowes, *landscape modeler*; Charles E. Brown, Hans Sauer, Olive C. Wheeler and Lydia Nehrling, *attendants*.

Paleontology. 14,459 specimens, the Niagara and Hamilton groups being best represented.

Mineralogy and geology. 6419 specimens.

Historic geology. Stratigraphic and paleontologic series included in enumerations above.

Zoology. 160,005 specimens: collections of mammals, birds, reptiles, fishes, shells, butterflies and beetles, corals, sponges, etc.; mounted groups of Wisconsin and North American birds and mammals are given special prominence with some extralimital species such as orang-utans, etc., also shown in groups.

Botany. 20,656 specimens: illustrating the flora of all parts of the world, but specially of Wisconsin.

Anthropology. 27,144 specimens.

Library. 9258 bound books and volumes of pamphlets, all treating on natural history subjects.

Northwestern university, Watertown. No report.

Provincial seminary of St Francis, St Francis. Small general collection of 1500 specimens.

Ripon college, Ripon. C. Dwight Marsh, *professor of biology*, in charge; W. S. Leavenworth, *professor of chemistry and physics*, in charge of mineralogic collection.

Paleontology. 1000 specimens, mainly from New York and Wisconsin, including one of Prof. Chamberlain's duplicate collections made by the Wisconsin geological survey.

Mineralogy. 2000 specimens forming a fairly complete typical series of mineral species and including the Barber collection of material, chiefly from New England; the Walcott collection, mainly from New England and New York; also a specially good collection of Lake Superior copper ores and Wisconsin iron ores.

Lithology. Not extensive.

Zoology. Collections are representative of most divisions of the animal kingdom. The best are those of echinoderms and crustaceans. There is a specially large collection of microscope slides and alcoholic specimens of Copepoda. Some material for exchange.

Botany. 1500 specimens of phanerogams and ferns.

Ethnology. A few stone and copper implements from Wisconsin.

University of Wisconsin, Madison. E. A. Brogè, *acting president*; William H. Hobbs, *mineralogy and petrology*; J. Morgan Clements, *geology and paleontology*; William S. Marshall, *zoology*; W. S. Miller, *vertebrate anatomy*; R. A. Harper, *botany*. The university museums comprise the geologic and mineralogic museum, the biologic museum and herbarium which occupy respectively the second and third floors of the south wing of Science hall.

Paleontology. Collections include that of the Wisconsin Academy of sciences, arts and letters, containing the type fossils described in the volumes of the first geological survey of Wisconsin; the Powers collection of Wisconsin Silurian fossils; and the systematic collection of fossils and casts of fossil forms belonging to the university. The type fossils of the Wisconsin academy are arranged in a special case in the geologic and mineralogic museum; the other specimens are systematically distributed in a number of cases.

Mineralogy. 34,100 specimens: the Henry collection of 30,000 specimens, which is particularly rich in minerals from the zinc and lead region of southwestern Wisconsin; a systematic mineral collection of 3000; and a systematic collection of crystals numbering 1000; also 100 oriented sections of minerals.

Economic geology. A metallurgic collection of 5000 specimens is exhibited.

Geology and lithology. 26,930 specimens; 13,900 microscopic slides: a set of the Rosenbusch collection of typical rocks, chiefly European, with a number of microscope slides, 550 specimens; 600 sections from the type rocks of the Wisconsin geological survey; the Brooks collection of 150 specimens from the Menominee region of Michigan; 230 from the Archean formations of Missouri; a general collection of 1000 crystalline rocks; a series of 500 Cambrian and post-Cambrian rocks and relief models to illustrate geologic and topographic features.

In Science hall, in condition for easy reference, is a large collection of rocks from representative crystalline areas of North America, belonging to the United States geological survey. The collection numbers over 40,000 specimens and 16,000 thin sections. Of these, 30,000 specimens and about 12,000 thin sections are of rocks from the Lake Superior region; 3000 specimens and 300 thin sections of New England crystallines; and the remainder from other typical crystalline areas of North America. In this building there is also located the following collections; 1500 specimens, chiefly from European localities, and 1000 microscopic slides in the private collection of crystalline rocks of the professor of mineralogy and petrology; special collections of engineering specimens and the collection of Wisconsin clays and building stones made by the Wisconsin geological survey.

Zoology. 50 skeletons and skulls; 80 mounted birds and about 100 skins; 100 species of echinoderms; 75 specimens of invertebrates; 1400 species of shells; both Ward's and Blaschka's series of models of invertebrates; and a good set of embryologic models; also good set life histories of insects both alcoholic and dry.

Botany. 10,000 sheets of phanerogams and vascular cryptogams from outside the state, and 3000 to 4000 sheets from with-

in the state; 7000 labeled specimens of Musci, including all the more important American forms; large collections of fleshy and parasitic fungi; a few exsiccatae of American algae and lichens; a small series of American woods; a small series of Brazilian woods; Hough's sections of American woods, and a number of papier-maché models illustrating the organs and structure of flowering plants.

Wisconsin academy of sciences, arts and letters, Madison. Ernest B. Skinner, *secretary*.

This academy has no natural history collections except a few fossils which are included in the collections of the University of Wisconsin.

WYOMING

University of Wyoming museum, Laramie. Wilbur C. Knight, *curator*.

Paleontology. 3000 specimens: good collection of the invertebrates from the Jurassic and Cretaceous formations of the Rocky Mountains of the United States; one of the largest collections of Jurassic dinosaurs from American localities in the world and the largest collection of Western Jurassic swimming saurians known. This collection contains type material as follows: *Ceratodus americanus* and *robustus*, *Megalneusaurus rex*, (type genus and species); *Cimoliosaurus laramiensis*; *Plesiosaurus shirleyensis* and *Cycadella*, a new genus of fossil cycad and 21 species. There is a lot of material in the Jurassic collection awaiting description. Duplicates of vertebrates and invertebrates offered for exchange.

Mineralogy. 700 specimens. Duplicates of Wyoming minerals for exchange.

Economic geology and lithology. 1700 specimens the most of which relate to the formations of the Rocky Mountains. Duplicates of Wyoming rocks for exchange.

Zoology. 850 specimens; in this collection there are about 550 bird skins representing the fauna of Wyoming.

Botany. The Rocky Mountain herbarium, Aven Nelson, *curator*, contains 40,000 specimens and the greatest number of

Rocky Mountain plants in any herbarium west of the Mississippi river.

Ethnology. 420 specimens of relics of the aboriginal inhabitants of Wyoming.

CANADA

BRITISH COLUMBIA

Provincial museum, Victoria. John Fannin, *curator*; F. Kermode, *taxidermist*; D. Withrow, *caretaker*; E. Anderson, *floor-walker*.

Paleontology. 3076 specimens.

Zoology. 11,659 specimens.

Botany. 564 specimens.

Ethnology. 1663 specimens.

Owing to the limited space for exhibition, this museum does not make exchanges. It is reserved almost exclusively as a provincial museum.

MANITOBA

Historical and scientific society of Manitoba, Winnipeg.

Paleontology. A few interesting local fossils.

NEW BRUNSWICK

Natural history society of New Brunswick, St John.

This collection includes those of the Mechanics institute. These are kept separate, and include that of Dr Gesner (rocks, minerals and fossils) made when he was employed on the geologic survey of New Brunswick; also some of Hartt's fossil insect types.

University of New Brunswick, Fredericton. L. W. Bailey in charge.

Paleontology. Cambrian, Cambro-Silurian, Silurian, Devonian, Carboniferous, and Quaternary formations; fossils of New Brunswick. A number of types of Cambrian fossils described and named by Dr G. F. Matthew from the rocks of St John; the types of Devonian fossils established by Dawson and Hartt from Carleton near St John, and fishes from the shores of Bay of Chaleurs; fossil fishes, Devonian, from the Albert mines; various mollusks and starfishes and a large fresh-water fish, Quaternary; fossils from Nova Scotia, including Silurian, Eo-De-

vonian and Carboniferous; fossils of Canada, from collections of the geological survey; American fossils, chiefly from Cincinnati group, and Lower Carboniferous; European fossils, chiefly Mesozoic and Tertiary, obtained by purchase.

Mineralogy. A general collection; a special collection of New Brunswick minerals.

Geology. Collections of Canadian rocks, chiefly Laurentian (St Lawrence, Saguenay, etc.) and Huronian; New Brunswick rocks, one series arranged according to age; another as illustrative of counties.

Zoology. The zoologic collections consist of 1) skulls of man, Quadrumana, Carnivora, Herbivora, Cetacea, Rodentia, Insectivora—with a few entire skeletons; 2) a small collection of mounted birds and mammals; 3) a collection of birds eggs identified and catalogued by Tappan Adney, New York; 4) about 200 numbered and catalogued fishes in alcohol from collections of United States fish commission; 5) a collection of marine invertebrates in alcohol from collections of United States fish commission; 6) collection of marine invertebrates, crustaceans, echinoderms, corals and sponges from Museum of comparative zoology, Cambridge Mass. and National museum, Washington D. C.; 7) a general and special conchological collection; 8) a collection of reptiles in alcohol from Boston society of natural history.

Botany. The botanical collections consist of 1) a collection of New Brunswick phanerogams and ferns, made by Dr James Robb and arranged on the Linnaean system; 2) a collection similar to the above but made by Prof. L. W. Bailey and arranged upon the natural system; 3) a collection of North American phanerogams from the herbarium of Prof. W. W. Bailey, Providence R. I.; 4) a collection of mosses, lichens and fungi; 5) a collection of diatoms, confervae, etc. mounted for the microscope.

None of the above collections are large, and additions to any of them would be very welcome.

Archeology. Collections of prehistoric relics from New Brunswick; stone weapons and utensils, pipes, pottery, etc.

NEWFOUNDLAND

Museum of the geological survey of Newfoundland. See Addenda, p. 223.

NOVA SCOTIA

Acadia college museum, Wolfville. Ernest Haycock in charge.

Paleontology. 500 to 600 specimens: a working collection representing all geologic horizons, but richest in Carboniferous and Devonian forms; a cabinet collection put up in England, representing in a manner the whole range of English geology, and a collection of corals from Ontario, and Silurian forms from Gaspé and Anticosti.

Mineralogy. Several hundred specimens: a collection of several hundred from Ottawa; a large collection purchased of Ward & Howell; and a series of the zeolites from the trap rocks of Nova Scotia.

Historic geology and lithology. Series of specimens illustrating the rocks of New York state and typical rocks from all parts of the world, purchased of Ward & Howell; and a representative series of Canadian rocks.

Economic geology. 300 specimens: ores purchased of Ward & Howell; and collections of gold-bearing quartz, antimony sulfid, manganese dioxid and other ores of Nova Scotia.

Zoology. A few mammals of Nova Scotia; a small collection of birds; a large collection of unios and specimens of shells of nearly all the marine orders.

Botany. A herbarium containing many species of plants of Nova Scotia and New Brunswick, prepared by G. U. Hay, of St John, New Brunswick.

Ethnology. Indian arrowheads and axes; bows and arrows from the Canadian northwest, and from India; weapons and domestic utensils from India and Burmah, and numerous articles from all parts of the world, specially from Hudson bay region and from China and Japan.

This museum is considered the most instructive and attractive in Nova Scotia.

Dalhousie college, Halifax. No report.

King's college, Windsor. Prof. Vroom, *acting curator*.

Paleontology. W. B. Almon collections, a few fossils from Scotland; Silurian and Devonian fossils from Arisaig, N. S.; a small collection of Australian fossils and Silurian and Devonian

fossils from Great Britain. The museum has a few specimens for exchange.

Mineralogy. A good collection of Nova Scotia minerals.

Historic and economic geology and lithology. A fair working collection.

Zoology. The museum has nothing of importance in this department.

Botany. Cogswell herbarium, phanerogamous and cryptogamous plants of Great Britain; Ball herbarium, 250 Nova Scotia plants; Strange herbarium, plants from India; Gossip herbarium, small collection from Scotland; McMorine herbarium of over 1000 Canadian and United States plants.

Ethnology. This collection consists of Maori clothing, Zulu weapons and Tahiti carved work.

A few specimens of historical (provincial) interest are also contained in the museum.

Provincial museum, Halifax. Harry Piers, *curator*.

Paleontology. Nova Scotian fossils, chiefly Carboniferous; specimens illustrating the late Dr D. Honeyman's writings and some type specimens.

Mineralogy. A general collection and a special (Nova Scotian) collection. Zeolites well represented.

Historic and economic geology and lithology. Collections illustrating local (Nova Scotian) historic and economic geology and lithology and specimens illustrating the late Dr D. Honeyman's writings on the geology of Nova Scotia. Also a general lithologic collection.

Zoology. Collections of Nova Scotian mammals, birds, birds eggs, reptiles, batrachians, fishes, and invertebrates. Also type specimen of *Sthenoteuthis megaptera* (Verrill) (large broad finned squid).

Botany. An herbarium of Nova Scotian plants (including some algae); collection of Nova Scotian woods; large series of water-color paintings of Nova Scotian wild flowers; Nova Scotian grains, grasses and fruits.

Ethnology and anthropology. Relics of the stone age in Nova Scotia; specimens illustrating the implements etc., at present used by the Micmac Indians. Foreign ethnologic and anthro-

pologic material is at present stored in boxes for want of room for their proper display.

There are also in this museum specimens illustrating various industries of Nova Scotia; numismatic collection (ancient and modern coins and casts) with descriptive manuscript catalogues; some local historic specimens; and a few oil portraits of merit. Connected with the museum is the Provincial science library.

ONTARIO

Geological survey of Canada, Ottawa. Robert Bell, *acting director*.

The most complete collection known of specimens illustrative of Canadian geology, zoology, botany, archeology and ethnology.

Paleontology. 16,000 Canadian specimens classified and exhibited, representing 4600 species, 1000 of which are types described by E. Billings, and about 400 types described by J. F. Whiteaves; a number of types of Cretaceous and Tertiary plants described by Sir J. William Dawson; Cretaceous vertebrates described by Prof. H. I. Osborn and Lawrence M. Lambe; also types of species established by Prof. E. D. Cope, Dr S. H. Scudder, Prof. T. Rupert Jones, A. H. Foord, Prof. H. A. Nicholson, E. O. Ulrich, W. R. Billings and others; unique collection of Ordovician crinoids, etc., from Ottawa and vicinity; Devonian fishes from the Bay of Chaleurs; original specimens of *Eozoon canadense*.

Mineralogy and lithology. 7000 Canadian specimens catalogued and on exhibition; Madoc and Thurlow meteorites.

Zoology. Representative specimens of nearly all the known birds and mammals of Canada.

Botany. The most complete herbarium extant of Canadian plants. A collection of the woods of Canada and of photographs of her forest trees.

Hamilton scientific association, Hamilton. The association has some interesting local fossils.

Kingston school of mining, Kingston. The museum is in charge of the several professors of geology and mineralogy.

Paleontology. The collection of Canadian fossils which was exhibited at the World's Columbian exposition by the geologic

survey department of Canada, and afterward presented to this school.

Mineralogy. 10,000 specimens, specially arranged to illustrate the lectures on descriptive, physical, and economic mineralogy. Many duplicates for exchange, including zircon, sphene, apatite, etc.

Historic geology and lithology. 4000 or 5000 specimens. Many duplicates for exchange.

This institution is affiliated with Queen's college, and the collections are used jointly.

Ontario agricultural college, Guelph. James Mills, *president*; William Lockhead, *curator and professor of biology and geology*.

The museum consists of a series of cases containing the most important minerals found in rocks; a series of 16 cases representing the characteristic fossils found in the geologic systems represented in Canada.

Perth collegiate institute museum, Perth. William Hardy, *principal of the institute*, and H. S. Rosevlar, *science master*, in charge.

Paleontology. Some trilobites, lamellibranchs and brachiopods from the Devonian formations; some Silurian cephalopods and other material, as yet unclassified.

Mineralogy. 400 specimens: iron and copper ores from eastern Ontario; copper and nickel ores from Sudbury; phosphate, mica and asbestos from the Perth district, and specimens of nearly every variety of silicates from the Laurentian district near Ottawa.

Lithology. 800 specimens: chiefly of massive eruptive and crystalline rocks; also a collection of concretionary forms.

Botany. 300 specimens of the flowering plants of eastern Ontario.

Provincial ethnological museum, Toronto.

Zoology. 400 specimens vertebrates, mollusks, insects of Ontario.

Botany. 500 specimens Ontario plants.

Ethnology and anthropology. 900 specimens representing Iroquois, Blackfoot, Blood and Kwakiutl Indians of Canada—Eskimo, Navajo, Zuni, Pima, Poma. Life masks of British Columbia and Washington Indians. Collections from China,

New Hebrides, Paraguay and Africa. 300 busts of European and United States scholars and celebrities. 2000 archeological specimens, photographs, paintings, etc. illustrative of people, mainly of Ontario, Mexico. Southeastern United States, Costa Rica and other countries are represented.

Queen's college and university museum, Kingston. James Fowler in charge.

Paleontology. 5000 specimens of general distribution.

Mineralogy. 3600 specimens from various sources.

Historic geology. The Rev. Andrew Bell collection of 1000 specimens illustrating a north and south stratigraphic section across the province from Lake Erie and a series of 500 specimens illustrating a stratigraphic section across the Ottawa river.

Lithology. An extensive collection which together with other collections in this department, is stored in the school of mining and agriculture in connection with the university.

Zoology. 3146 specimens: 26 mounted mammals; 130 mounted birds; 40 specimens of fishes; 200 alcoholic preparations and 150 dried specimens of invertebrates; small collections of reptiles and of insects, and 2600 mollusks.

Botany. 9450 mounted sheets: illustrating 1200 genera and 3650 species; a private herbarium of 14,731 sheets illustrating 2157 genera and 8650 species. Several thousand duplicates for exchange.

Ethnology. 500 specimens: a collection of Indian relics; a few hundred articles from China, Japan, the Pacific islands, Turkey, India and other countries.

University of Toronto, Toronto. GEOLOGICAL AND MINERALOGICAL MUSEUM. A. P. Coleman, *professor of geology*, curator; T. L. Walker, *professor of mineralogy*.

Paleontology. General collection for teaching purposes, 10,800 specimens. Pleistocene 2500 specimens, 227 species; the Townsend collection, 6400 specimens, 820 species. There is in addition a collection of fossils in the biological museum to illustrate systematic geology.

Mineralogy. 7125 specimens: Ferrier collection, 3700 specimens; general collection, 1400 specimens; students working col-

lection, 2025 specimens. The Ferrier collection of minerals is temporarily placed in the biological museum.

Petrography. 2810 specimens: 1440 Canadian rocks. 620 specimens in general collection and 750 specimens for students use.

Economic and structural geology. 390 specimens. Bureau of mines. Collection of economic rocks and minerals, 2000 specimens; building stones, 200 specimens; collection of 245 specimens to illustrate applied chemistry.

BIOLOGICAL MUSEUM. R. Ramsey Wright, *professor of biology*, in charge; B. A. Bensley, *assistant curator of zoological collections*; W. H. F. Addison, *temporary catalogue assistant*; A. Pride, *sub-curator and preparator*.

Paleontology. A small collection of animal fossils, arranged in ascending series, as a diagram to the biologic student of the succession of the fossiliferous formations of Europe and America. Specimens and models of fossils are also incorporated in their proper systematic position, specially of such forms as have a high morphologic and philogenic interest.

Zoology. 1100 catalogue entries of mammals; 3500 of birds and 900 of reptiles. The museum is rich in models and preparations illustrative of anatomy and animal development.

Botany. Herbarium and collection of models, chiefly by Brendel. The space now temporarily occupied by the university mineral collections is to be devoted to botanical collections.

The museum is primarily intended to supplement the teaching in the biologic department. It affords a floor space of 7500 square feet.

ETHNOLOGICAL MUSEUM. G. W. Wrong, *professor of history*, in charge. This museum is in the main building of the university and contains a fair collection of skulls including ancient Egyptian and Roman skulls and models of famous skulls of importance in ethnologic investigations—The Neanderthal, Cro-Magnon, etc. There are paleolithic implements from the English and French drift. The feature of the greatest interest is the collection of stone implements from various parts of Canada, specially of the district in which Toronto is situated.

Victoria university museum, Toronto. N. Burwash, *president*.

Paleontology. 2000 species of European fossils principally purchased from Krantz, chiefly Corniferous to Quaternary. About 1000 species chiefly Paleozoic, of Canadian and United States formations.

Petrography. 500 specimens of European and Canadian rocks.

Mineralogy. 1000 specimens of European and Canadian minerals.

Anthropology. The museum also has a very fine meteorite weighing nearly 400 pounds worshiped by the Crees for many generations as a divinity, a small collection of Indian antiquities from Ontario, Manitoba and British Columbia, some from the Pacific Islands and a very valuable collection from Japan including ancient pottery, arms, musical instruments and articles illustrating the life of the aborigines of the northern islands and the old Japanese civilization.

A collection of Egyptian antiquities includes a mummy about 600 B.C., various ancient images, hieroglyphic inscriptions on stone, wood and papyrus, ancient glass and pottery.

The collection of Indian antiquities has been recently enlarged by the purchase of dress, arms, utensils, drums, conjurers implements, totems, stone implements and other material from the Piegans, Blackfeet and the Indians of Alaska.

QUEBEC

Laval university, Quebec. J. C. K. Laflamme, *curator*.

Paleontology. General collections illustrating all formations, specially rich in Canadian Silurian and Devonian forms which have been identified and arranged by E. Billings and Dr Ami. 400 Niagara fossils presented by C. C. Grant and a collection of the fossils of Quebec presented by Dr J. M. Ahearn. Mesozoic and Tertiary fossils including a collection from Paris presented by the Abbé Baret of Ablainville; casts of protichnitis from the Potsdam of Canada and reptilian tracks from Turner's Falls.

Mineralogy. 4000 specimens. The old Quebec seminary collection with many additions arranged by Dr Thomas Sterry Hunt. A collection made for the Quebec seminary by the Abbé Haüy. Collection of exclusively Canadian minerals and sets showing

hardness and other properties; a collection of crystals presented by the Paris school of mines.

Lithology. A collection of rocks from the Paris museum of natural history prepared by Stanislaus Meunier; collections of Canadian rocks.

Economic geology. Copper ores from eastern Canada; iron ores from Leeds, St Urbain and Saguenay; auriferous quartz from Beauce; crude and manufactured crysolite from Thetford and Coleraine and a series of Canadian phosphates.

Zoology. General collection including many Canadian mammals.

Botany. Herbarium of 10,000 specimens including collections from Canada and the United States; collections from the Northwest presented by the Canadian geological survey. There are also collections of woods from Canada, France and from the English markets. Models of edible and poisonous mushrooms and specimens illustrating abnormal development, natural grafts and vegetable diseases.

McGill university (Peter Redpath museum), Montreal. B. J. Harrington, *honorary curator*.

Paleontology. Collections of Sir J. W. Dawson, largely Carboniferous and Devonian fossil plants; Microsauria and post-Pliocene mollusks of Canada; many types of species of Eozoon.

Mineralogy and geology. Many fine Canadian and foreign minerals and rocks; the Holmes and Miller collections of minerals.

Zoology. The Carpenter collection of shells, and other collections illustrating various departments of zoology.

Botany. The university herbarium, including the Holmes herbarium and other special collections.

Montreal college, Philosophy house, Montreal.

Mineralogy. A collection of minerals made by the Abbé Haüy, similar to that at Laval.

Natural history society of Montreal, Montreal.

Paleontology. General collection of fossils.

Mineralogy. The C. U. Shepard collection of minerals of 4000 specimens, presented by Dr Holmes; many good specimens of old finds.

SYNOPTIC LIST OF MUSEUM COLLECTIONS

Numbers refer to specimens except as otherwise stated.

NAME	PAGE	PHYSICAL AND CHEMICAL GEOLOGY	MINERALS	FOSSILS	ZOOLOGY			BOTANY		ETH- NOLOGY
					Insects	Other inverte- brates	Verte- brates	Crypto- gamis	Phanero- gamis	
UNITED STATES										
Alabama										
Ala. polytechnic institute mus, Auburn...	4	200	600	<i>a</i>		75		19 528	20 606	<i>a</i>
Geol. sur. of Alabama University.....	4	<i>b</i> 75 000	4 800	<i>c</i> 75 000	7 000		1 100	5 300		435
Arizona										
Univ. of Arizona Terr. mus. Tucson.....	5	3 000	2 500	.....		1 500		10 000		<i>a</i>
Arkansas										
Hendrix coll. mus. Conway.....	5	72	800	.....		100		3 500		
Univ. of Arkansas mus. Fayetteville.....	6	350	2 000	1 800		2 900				
California										
California academy of sciences.....	221	<i>a</i>	<i>a</i>	.....		<i>d</i>		110 000		2 200
Golden Gate Park mus. San Francisco...	6	.....	2 322	2 000		24 000		404		3 416
Leland Stanford jr mus. Palo Alto.....	7	<i>e</i>	<i>e</i>	<i>e</i>		<i>e</i>		<i>e</i>		<i>e</i>
San Diego soc. of nat. hist.....	8	<i>a</i>	<i>a</i>	<i>a</i>		400		1 500		<i>a</i>
Santa Clara coll. mus.....	8	2 300		1 000						<i>a</i>
State mining bureau, San Francisco.....	9	.....	15 750	.....						<i>a</i>
Univ. of California, Berkeley.....	9	<i>d</i>	<i>d</i>	<i>d</i>		<i>d</i>		<i>d</i>		<i>d</i>
Univ of Southern California, Los Angeles	12	1 000	3 700	2 950	<i>a</i>	20 350	1 000	3 100		730
Colorado										
Bureau of mines of Colorado, Denver.....	12	<i>a</i>	<i>a</i>	<i>a</i>						
Colorado scientific soc. Denver.....	13	500	1 000	400						
Colorado school of mines, Golden.....	13	1 800	29 000	2 440						
<i>a</i> Small collection. <i>b</i> Including fossils. <i>c</i> Including geology. <i>d</i> Large collection. <i>e</i> Collections not enumerated.										

a Small collection.*b* Including fossils.*c* Including geology.*d* Large collection.*e* Collections not enumerated.

Synoptic list of museum collections (*continued*)

NAME	PAGE	PHYSICAL AND CHEMICAL GEOLOGY	MINERALS	FOSSILS	ZOOLOGY			BOTANY		ETH- NOLOGY
					Insects	Other inverte- brates	Verte- brates	Crypto- gams	Phanero- gams	
Colorado (<i>continued</i>)										
State agric. col. Fort Collins	13	<i>a</i>	<i>a</i>	50	40 000	.....	1 000	2 300	4 000	<i>a</i>
Univ. of Colorado mus. Boulder.....	14	1 500	1 175	500	.....	600	.....	4 000	.....	<i>a</i>
Connecticut										
Connecticut agric. college, Storrs.....	15	750	700	500	.....	10 000	.....	1 000	.....	75
Peabody mus. nat. hist. Yale, New Haven	15	<i>d</i>	<i>d</i>	<i>d</i>	.....	<i>d</i>	.....	<i>d</i>	.....	<i>d</i>
Scientific ass'n of Meriden.....	16	1 200	2 000	.....	.....	.....	.....	.....	.....	<i>a</i>
Trinity col. mus. Hartford.....	17	<i>a</i>	<i>a</i>	<i>a</i>	.....	.....	.....	<i>a</i>	.....	<i>a</i>
Wesleyan univ. Middletown.....	17	<i>a</i>	12 000	15 000	.....	110 000	.....	11 000	.....	8 000
Delaware										
Delaware college, Newark.....	18	300	600	250	.....	200	.....	1 000	.....	<i>a</i>
Soc. of nat. hist. of Delaware, Wilmington	19	.....	1 500	.....	<i>a</i>	.....	400	50 000	.....	<i>a</i>
District of Columbia										
Catholic univ. of America, Washington..	19	.....	.....	.....	.....	.....	.....	.....	40 000	.....
Columbian univ. Washington	20	<i>a</i>	<i>a</i>	<i>a</i>	.....	<i>a</i>	.....	<i>a</i>	<i>a</i>	<i>a</i>
Georgetown univ. Coleman mus.....	20	1 100	4 000	1 500	.....	10 000	.....	<i>f</i>	<i>f</i>	<i>a</i>
Howard univ. nat hist. mus. Wash.....	20	.....	800	500	.....	1 000	.....	2 200	.....	<i>a</i>
U. S. national museum, Washington.....	21	75 739	35 433	444 569	1 846 000	1 449 881	467 366	526 751	.....	932 547
Florida										
John B. Stetson univ. De Land	26	<i>a</i>	<i>a</i>	<i>a</i>	.....	.....	.....	<i>a</i>	.....	<i>a</i>
Georgia										
Emory college, Oxford.....	26	<i>a</i>	5 000	200	.....	<i>a</i>	.....	<i>a</i>	.....	.....
Geol. survey (state museum) Atlanta.....	26	<i>d</i>	930	.....	.....	.....	.....	400	.....	203

Mercer univ. Macon	27	6 000	a	2 500	.....	400	300	200	500
Univ. of Ga. Athens	28	.....	a	.....	.....	.....	.....	.....	a
Idaho									
Univ. of Idaho, Moscow	28	a	1 000	250	16 000	.....	a	10 000	100
Illinois									
Augustana college, Rock Island	29	800	500	4 000	1 000	2 000	.....	3 000	1 500
Chicago acad. of sciences	29	1 000 {	3 500	10 000	20 000	75 000	m	5 700	1 000
Chicago univ. Walker mus.	32	2 500	5 000	400 000	d	d	d	d	3 000
Col. of liberal arts, N. W. U. Evanston ..	33	22 000	d	4 300	.....	18 000	4 600	20 000	8 000
Elgin scientific society	34	a	a	a	10 000	d	d	150 000	d
Field Columbian mus. Chicago	34	12 000	11 000	7 000	10 000	d	d	.....	.....
Ill. state mus. of nat. hist. and geol. sur.	39	.....	2 500	5 000	a	.....	a	.....	.....
Springfield	39	d	d	d	1 000	15 000	1 000	6 000	1 140
Ill. Wes'n univ. Powell mus. Bloomington	41	.....	1 250	2 100 {	2 000	2 500	400	20 000	150
Knox College, Galesburg	41	.....	.....	a	f	species	species	.....	.....
Lake Forest univ. mus.	42	75 {	600	300	f	f	f	14 000	350
Northwestern college, Naperville	42	cases }	5 000	12 000	a	a	a	a	500
Taylor mus. Blackburn univ. Carlinville ..	43	6 000	10 900	45 000	70 000	11 000	40 000	800	800
Univ. of Ill. Champaign	44	.....	1 000	35 000	1 000	.....	a	a	300
Indiana									
Franklin college, Gorbey collection	44	a	a	a	a	a	a	a	a
2 Hanover col. mus.	45	1 500	1 000	5 000	3 000	10 000	d	500	1 000
Ind. univ. mus. Bloomington	45	.....	1 000	4 000	6 000	.....	6 000	5 000	300
Purdue univ. Lafayette	46	.....	1 000	500	.....	.....	100	f	6 000
Taylor univ. Walker mus. Upland	46	400	4 000	4 300	10 000	.....	825	1 500	30 000
Wabash col. Hovey mus. Crawfordsville ..	47	a	a	a	a	a	a	a	a
Indian Territory									
Indian univ. Bacone	47	a	a	a	a	a	a	a	a

a Small collection. d Large collection. f Local collection. m Complete local collection.

1 2500 specimens. 2 500 specimens.

Synoptic list of museum collections (continued)

NAME	PAGE	PHYSICAL AND CHEMICAL GEOLOGY	MINERALS	FOSSILS	ZOOLOGY			BOTANY		ETH- NOLOGY
					Insects	Other inverte- brates	Verte- brates	Crypto- gams	Phanero- gams	
Iowa										
Amity col. mus. College Springs.....	48	1 000		2 000		500		100		200
Davenport acad. of sciences.....	48	d	d	d		d		d		d
Iowa col. Parker mus. nat. hist. Grinnell	48	a	1 000	2 000		3 000		1 500	2 500	a
Muscantine acad. of sciences.....	49	g	g	g		g		g		g
State univ. of Iowa, Iowa City.....	49		30 000			100 000		175 000		800
Upper Iowa univ. Fayette.....	50	100	500	1 000	100	250	250	9 000	3 000	125
Wartburg teachers sem. & acad. Waverly	50	352	1 434	938		1 128		1 151		452
Kansas										
Baker univ. mus. Baldwin.....	51	500	4 810	21 156	32 798	9 000	1 800		7 789	900
Bethany college, Lindsborg.....	51	100	800	500		1000		1 500		2 000
College of Emporia, Emporia.....	52	200	300		250		250	250		
Kan. state agric. col. Manhattan.....	52		3 000		20 000		8 000			
Kan. Wesleyan univ. Salina.....	52	500	1 200	900	6 000	900	150	200		300
Midland col. mus. Atchison.....	53	500		800		120		1 000		a
Univ. of Kansas Lawrence.....	53	2 000	12 000	40 000		125 000		22 000		500
Washburn col. mus. Topeka.....	55	500	500	8 000		2 000		2 000		.....
Kentucky										
Kentucky univ. Lexington.....	55	200	500	500		250	1 375			300
Louisville public library.....	56	500	6 000	1 000			3 000	d		500
Ogden col. Bowling Green.....	56	200	2 000	2 000	a	a	a			
State geol. dep't, Lexington.....	57	d	d	d	d	d	d	d	d	d
Louisiana										
Louisiana state university, Baton Rouge	58	a	a	a	150 cases	d	d	2 000		a
Tulane univ. Tulane mus. New Orleans...	58	300	5 000	3 000	d	d	d	45 000		

Synoptic list of museum collections (continued)

NAME	PAGE	PHYSICAL AND CHEMICAL GEOLOGY	MINERALS	FOSSILS	ZOOLOGY			BOTANY		ETH- NOLOGY
					Insects	Other inverte- brates	Verte- brates	Crypto- gams	Phanero- gams	
Minnesota (continued)										
Hamline univ. mus. of nat. hist. St Paul.	85	1 000	a	1 000	1 000	2 350	1 750	3 300		200
Minn. acad. of nat. science, Minneapolis.	86	500	2 500	1 500	1 500	h	4 800	h		1 500
Minn. geol. & nat. hist. sur. Minneapolis.	87	h	h	h	h	h	h	h		h
Univ. of Minnesota, Minneapolis	87	12 600	13 400	37 000	-----	-----	-----	275 000 sp'cim'ns 4 000 jars		
Mississippi										
Millsaps college museum Jackson	88	a	a	a	a	a	a	a	a	a
Miss. agric. & mech. col. agric. college	88	-----	500	500	10 000	70	a	2 000	4 000	
Univ. of Mississippi mus. of nat. hist. & geol. University	89	a	a	a	a	a	a	a	a	a
Missouri										
Bureau of geology and mines, Rolla	89		32 000							
Drury college, Springfield	89	1 500	1 500	2 500	850		300	400	1 400	a
Pritchett college museum, Glasgow	90	2 000		10 000	400		900	-----	500	350
Univ. of Mo. school of mines & metal. Rolla.	91	3 500	7 000	500						
Univ. of state of Mo. univ. mus. Columbia.	91	2 000	1 500	1 500						
Washington univ. mus. St Louis	92	7 000	10 000	20 000		15 000				
Montana										
Mont. col. of agric. & mech. arts, Bozeman.	92	-----	5 000	2 000		7 000		12 000		
Nebraska										
1 Creighton univ. mus. Omaha	93	a	a	a	a	a	a	a	a	a
Doane college biol. & geol. mus. Crete	93	-----	600	350		700	450	2 500		150
Univ. of Nebraska, state mus. Lincoln	94	d e	d e	d e		d e	d e	d e	d e	d e

New Hampshire

Dartmouth col. Butterfield mus. Hanover.
 Keene high school museum.....
 Keene nat. hist. soc.....
 N. H. col. of ag. and mech. arts, Durham

New Jersey

New Jersey geol. sur. Trenton.....
 N. J. state mus. Trenton.....
 Princeton univ. museums, Princeton.....
 Rutgers col. G. H. Cook mus. N. Brunswick

New Mexico

N. M. col. of ag. & mech. arts, Mesilla Pk

New York

Alfred univ. mus. Alfred.....
 Am. mus. of nat. hist. New York.....
 Brooklyn inst. of arts and sciences, B'klyn
 Buffalo soc. of nat. sciences, mus. & lib..
 Buffalo state normal sch. mus.....
 Canisius college, Buffalo.....
 Colgate univ. mus. of geol. & nat. hist.
 Hamilton.....
 College of the City of N. Y. New York...
 Columbia univ. mus. New York.....
 Cornell univ. mus. Ithaca.....
 Glen Island mus. of nat. hist. N. Rochelle
 Hamilton college, Clinton.....
 Hobart college mus. Geneva.....
 Long Island hist. soc. mus. Brooklyn...
 Nat. sci. ass'n of S. I. New Brighton.....
 New York state museum, Albany.....
 New York univ. University Heights.....
 Niagara univ. museum.....
 Polytechnic institute mus. Brooklyn.....

94	18 200	2 000	a {	1 000	3 000	a	d	a
96	a	2 000	150	species	3 000	500	d	500
97	5 000	1 000	300	20 000	500	2 000	4 000	
97		1 500						
97	i	i	i				i	i
97	.....	1 500	d	325	100			a
98	5 240	76 000	5 000 species	20 000	d	d	d	3 000
102	2 600	11 700	5 750	d	d	d	d	1 700
103	.....	500	200	d	50	3 000		
104	a	1 600	1 500	2 000	20 000	6 000	d	5 000
105	d	d	d	d	d	d	d	d
110	a	3 000	7 000	130 000	12 000	40 000		d
111	2 885	1 218	31 000	1 535	3 332	14 935		5 000
112	50	300	400	.....	.....	400		
113	550	800	1 000	2 500	450	1 600		
114	a	a	a	1 300	1 400	2 700		a
114	2 400	7 500	500		3 750	550		a
115	d	25 000	50 000	d	d	500 000		
116	d	d	d	d	d	d	d	d
119	.....	.....	.....	4 300	500	500		a
120	1 250	10 000	2 500	13 000	2 000	2 595	9 154	
121	a	a	a		a			
121	a	a	292		2 000	4 000		1 600
122	a	200	a		600	3 000		
123	3 000	4 300	1 000 000 {	3 000	61 786	44 000		d
128	9 500		16 000		d	.....	.....	d
128	.....	400	600		130	300	.....	60
129	500	3 000	1 000		1 000	.....	.....	100

10,000 specimens. a Small collection. d Large collection. e Collection enumerated. h Listed under Univ. of Minnesota. i Collection in New Jersey state museum.

Synopsis list of museum collections (*continued*)

NAME	PAGE	PHYSICAL AND CHEMICAL GEOLOGY	MINERALS	FOSSILS	ZOOLOGY			BOTANY		ETH- NOLOGY
					Insects	Other invertebrates	Vertebrates	Crypto- gams	Phanero- gams	
New York (<i>continued</i>)										
Rensselaer polytech. inst. mus. Troy....	129	3 000	5 000	1 500	10 000		400	5 300		<i>a</i>
St Lawrence univ. mus. Canton.....	130	2 300	4 000	1 000	1 000			<i>a</i>		<i>a</i>
Syracuse univ. of nat. hist.....	130	700	1 000	1 700	1 000			5 000		<i>a</i>
Union col. nat. hist mus. Schenectady....	131	1 500	4 500	3 000 {	375 species	2 860 species	600 species	2 400	700	
Univ. of Rochester	131	3 000	5 000	25 000	1 000			<i>a</i>		<i>a</i>
Vassar col. mus. Poughkeepsie.....	133	800	3 500	8 150	25 090			1 700		770
Ward's nat. sci. estab. Rochester.....	135	22 000	160 000	150 000	137 000			74		5 826
West Point min. and geol. cab.....	136	4 500	5 913	9 074	.....	.....	.....	.....	.....	<i>a</i>
North Carolina										
Davidson college museum.....	138	.....	4 000	3 000	800			<i>df</i>	<i>df</i>	<i>df</i>
North Carolina state mus. Raleigh.....	138	<i>df</i>	<i>df</i>	<i>df</i>	<i>df</i>					
North Dakota										
North Dakota agric. col. mus. Fargo.....	139	.....	400	<i>a</i>	350			<i>a</i>		50
Red River Valley univ. mus. Wahpeton..	140	<i>a</i>	<i>a</i>	<i>a</i>	100			200		500
State univ. of N. D. mus. Grand Forks...	140	800	2 000	1 000	299			{ 440 species	1 200 species	650
Ohio										
Antioch col. Yellow Springs.....	141	<i>a</i>	500	10 000	4 000			600		<i>a</i>
Baldwin univ. mus. Berea.....	141	<i>a</i>	500	300	<i>a</i>			<i>a</i>		
Case sch. of applied science, Cleveland..	142	1 854	2 957	7 000	8 900			2 724		<i>a</i>
Cincinnati soc. of nat. hist.....	142	734	1 296	4 882	6 307			4 000		
Cuvier club of Cincinnati	143	.....	.....	.....	.....		<i>a</i>	.....	.....
Heidelberg univ. Tiffin.....	143	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>			<i>a</i>	<i>a</i>	<i>a</i>
Hiram college mus.....	144	100	1 200	1 000	1 000			<i>a</i>	<i>a</i>	2 000

Oberlin college mus.	144	{ 3 500 (trays) }	2 950 (trays) }	5 700 (trays)	20 000	35 000	3 500
Ohio state univ. mus. Columbus	145	2 500	500	11 000	40 000	83 000	100 000
Ohio Wesleyan univ. Delaware	147	1 000	2 000	5 000	25 000	300	1 200
Otterbein univ. Westerville	147	a	a	a	a	a	a
Seio college	147	800	3 000	.....	150	1 000	a
Urbana univ. mus.	147	a	a	a	a	a	a
Western Reserve univ. Cleveland	148	1 200	2 500	6 000	10 000	1 000	a
Oregon							
Oregon state agric. col. mus. Corvallis	148	900	1 000	6 000	75 000	10 000	325
Univ. of Oregon, Condon mus. Eugene	149	.....	800	.....	1 000	.....	.....
Pennsylvania							
Acad. of nat. sci. of Philadelphia	149	d 6 000 (trays)	36 000	91 400	200 000	10 000	10 000
Albright college, Meyerstown	151	a	775	700	1 300	500	300
Alleghany college, Meadville	151	a	10 000	a	5 150	f	100
Bryn Mawr college	152	2 500	950	35 000	.....	.....	.....
Carnegie museum Pittsburg	152	d	7 000	d	72 000	16 070	6 750
Geneva col. mus. Beaverfalls	153	a	a	a	{ species	4 100 }	a
Haverford college mus.	153	a	a	.....	4 000	1 500	a
Lafayette college mus. Easton	153	.....	1 000	.....	.....	.....	a
Muhlenberg college, Allentown	153	400	500	600	500	3 000	d
Pennsylvania college, Gettysburg	154	3 000	6 000	.....	.....	6 000	.....
Pennsylvania geol. sur. Harrisburg	154	10 000	135	4 220	.....	.....	.....
Pennsylvania state college, State College.	155	5 200	10 000	2 000	15 000	5 500	d
1 The Philadelphia museums	156	d	d	d	d	d	d
Swarthmore col. mus.	157	300	700	200	1 612	3 800	50
Univ. of Pennsylvania, Philadelphia	158	4 000	12 000	15 000	10 000	2 000	d
Wagner free inst. of science, Philadelphia	164	.....	2 000	20 000	25 000	1 000	1 200
Washington & Jefferson col. Washington.	164	1 000	2 500	d	2 000	500	800
Rhode Island							
Brown univ. Jenks mus. of zool. Provid'nce	165	500	5 000	10 000	25 000	.....	1 000
Mus. of nat. hist. Providence	166	a	1 200	750	1 200	4 800	5 000
R. I. col. of ag. and mech. arts, Kingston.	166	a	a	a	a	a	a

1 250,000 specimens. a Small collection. d Large collection. d Large local collection. f Local collection.

Synoptic list of museum collections (continued)

NAME	PAGE	PHYSICAL AND CHEMICAL GEOLOGY	MINERALS	FOSSILS	ZOOLOGY			BOTANY		ETH- NOLOGY
					Insects	Other inverte- brates	Verte- brates	Crypto- gams	Phanero- gams	
South Carolina										
Clafin univ. Orangeburg.....	167	300	3 000	250		1 500		1 000		1 000
College of Charleston.....	167	300	2 000	5 000	5 000		2 000	5 000		100
Furman university, Greenville	168	500	1 500	300	100	500		-----	-----	g
South Carolina college, Columbia.....	168	g	g	g	g	g		g		
South Dakota										
South Dakota geol. surv. Vermilion.....	168	j	j	j	j	j		j		j
State school of mines, Rapid City.....	168	1 200	3 000	900						
Univ. of South Dakota, Vermilion.....	169	850	700	1 125	200	2 000		2 000		a
Yankton college, Yankton.....	170	a	a	a	a	a		a		
Tennessee										
Cumberland univ. mus. Lebanon	170	600	-----	1 500	-----	a		a		
Fisk university, Nashville	170	-----	-----	-----	-----	500		2 000		410
Maryville col. mus.....	170	200	1 000	750		300		478		
So. western presbyterian univ. Clarksville.	171	a	6 000	a		16 000		500		
Univ. of Tennessee, Knoxville.....	172	a	a	a	d	a		a		a
Vanderbilt univ. Nashville.....	172	2 500	4 000	15 000		2 000		30 000		800
Walton univ. Nashville.....	172	50	400	100	18 000	1 000		5 000		150
Texas										
Univ. of Texas, Austin.....	173	d	d	d	d	d		d		d
Univ. of Texas min. sur. Austin.....	175	d	d	d						
Utah										
Univ. of Utah, Salt Lake City,.....	175	500	2 000	200		2 000		1 200		

Synoptic list of museum collections (concluded)

NAME	PAGE	PHYSICAL AND CHEMICAL GEOLOGY	MINERALS	FOSSILS	ZOOLOGY			BOTANY		ETH- NOLOGY
					Insects	Other inverte- brates	Verte- brates	Crypto- gams	Phanero- gams	
CANADA										
British Columbia	191	207	1 915	3 076		11 659		564		1 663
Provincial museum, Victoria.....										
Manitoba	191		<i>f</i>	<i>f</i>						
Hist. & sci. soc. of Manitoba, Winnipeg..										
New Brunswick	191	<i>a</i>	<i>a</i>	<i>a</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>		<i>d</i>
Nat. hist. soc. of St John.....	191	<i>d</i>	<i>d</i>	<i>d</i>						
Univ. of New Brunswick, Fredericton....										
Newfoundland	223	<i>a</i>	500	1 173	<i>a</i>	750	809	493		<i>d</i>
Mus. of the geol. sur. of N. F. St John's..										
Nova Scotia	193	<i>d</i>	<i>a</i>	600	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>a</i>	<i>a</i>
Acadia college mus. Wolfville.....	193	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>a</i>	<i>d</i>	<i>d</i>
Kings college, Windsor.....	194	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>	<i>d</i>		
Provincial mus Halifax.....										
Ontario	195	7 000		16 000	<i>l</i>	<i>l</i>	<i>l</i>	<i>l</i>	<i>l</i>	<i>l</i>
Geol. sur. of Canada, Ottawa.....	195	5 000		<i>f</i>						
Hamilton scientific ass'n, Kingston.....	195		10 000	<i>d</i>						
Kingston school of mining, Kingston.....	196	<i>a</i>	<i>a</i>	<i>a</i>						
Ont. agric. college, Guelph.....	196	800	400	<i>a</i>						
Perth collegiate inst. mus.....	196									
Provincial ethnological mus. Toronto....	196									
Queens col. & univ. mus. Kingston.....	197	<i>d</i>	3 600	5 000	2 950	400	196	300	500	2 200
								24 181	500	500

Univ. of Toronto.....	197	5 645	7 125	20 000	d	d	d	d	d
Victoria univ. mus. Toronto.....	199	500	1 000	3 000	.....	.....	.....	.....	d
Quebec									
Laval univ. Quebec....	199	a	4 000	a	d	d	d	10 000	d
McGill univ. Peter Redpath mus. Montreal	200	d	d	d	d	d	d	d	d
Montreal col. philosophy house.....	200	.....	a	a	d	d	d	d	d
Nat. hist. soc. of Montreal.....	200	a	a	a	.....	.....	.....	.....	d

a Small collection. d Large collection. f Local collection. l Complete Canadian collection.

PUBLIC BOTANIC AND ZOOLOGIC GARDENS AND AQUARIUMS IN THE UNITED STATES

The desirability of this list has become evident during the compilation of the directory of museums as the collections maintained are in many instances supplementary to the museums and contain so much material of great value to investigators in botany and zoology.

From the information at present on hand only a very incomplete notice can be given. The tendency in most of the large cities seems to be to maintain collections of living animals and botanic departments in the public parks where the work has not already been undertaken by scientific societies.

DISTRICT OF COLUMBIA

National zoological park, Washington. Director, *ex officio*; S. P. Langley, *secretary of the Smithsonian Institution*; Frank Baker, *superintendent*; A. B. Baker, *property clerk*; W. H. Blackburne, *head keeper*.

The number of animals in the collection, June 30, 1902, 883; estimated value of animals, \$38,000.

Approximate number of specimens: mammals, 123 species, 506 specimens; birds, 72 species, 232 specimens; reptiles, 32 species, 145 specimens. The aquarium is fitted with 17 tanks and usually contains from 40 to 70 species of fish and invertebrates, represented by from 150 to 400 specimens. A small working library is maintained at the superintendent's office. Animals which die in the collections are sent to the United States national museum.

MINNESOTA

Board of park commissioners, Minneapolis. J. A. Ridgway, *secretary*.

A limited zoologic garden under the direction of the superintendent of public parks is maintained and contains 25 species, 166 specimens of mammals and 130 birds.

NEW YORK

Buffalo zoological garden, Buffalo. F. A. Crandall jr, *curator*.

The collections consist of the following animals: mammals, 35 species, 159 specimens; birds, 24 species, 67 specimens; reptiles, 6 species, 44 specimens.

Rochester zoological park, Rochester. William Bausch, *chairman of zoological committee*; C. C. Lang, *superintendent of parks*.

The collections consist of: mammals, 38 species, 141 specimens; birds, 80 species, 371 specimens; reptiles 3 species, 3 specimens.

The New York zoological society. THE AQUARIUM, Battery park. Charles H. Townsend, *director*.

The collections consist of marine and fresh-water life and include only such forms as can be shown to advantage in tanks. While fishes constitute the main feature of the exhibit, batrachians, reptiles and seals represent the higher forms of life. Ascidians, crustaceans, worms, mollusks, echinoderms, anemones and corals, are among the lower forms shown.

The New York aquarium has the largest buildings and the most extensive collections of marine and fresh-water life in the world.

NEW YORK ZOOLOGICAL PARK, Bronx. William T. Hornaday, *director*.

Collections of living animals: mammals, 141 species, 612 specimens; birds, 175 species, 1005 specimens; reptiles, 131 species, 1198 specimens.

These numbers are subject to constant change. New animal houses are now being constructed and collections will be extended as facilities for their accommodation increase.

New York botanical garden museum, Bronx park. N. L. Britton, *director*; D. T. MacDougal, *first assistant*; John K. Small, *curator of the museums*; P. A. Rydberg, Arthur Hollick, Marshall A. Howe, F. S. Earle, *assistant curators*; George V. Nash, *head gardener*; Anna Murray Vail, *librarian*; H. H. Rusby, *curator of the economic collections*; William J. Gies, *consulting chemist*; F. A. Schilling, *superintendent*; John R. Brinley, *landscape engineer*;

Walter S. Groesbeck, *clerk and accountant*; Cornelius Van Brunt, *honorary floral photographer*.

Paleobotany. The collection of 8000 specimens is mainly the property of Columbia university. It was begun by the late Prof. J. S. Newberry and in addition to the exhibition series, contains specimens from almost every section of the world and from every geologic horizon. It is specially rich in North American forms. The Triassic Cretaceous and Tertiary plants are represented by specimens collected by the Hayden exploring expedition, Missouri and Yellowstone rivers 1859-60; the McComb and Ives explorations of the Grand, Green and Colorado rivers 1859-61, and by an extensive suite of specimens from the clay beds of New Jersey, on which Dr Newberry based his *Flora of the Amboy clays*. An exceedingly interesting local series is shown which was collected by Dr Arthur Hollick on Long Island, Block Island and Marthas Vineyard. The fossil plants are arranged primarily on the sequence of the geologic time divisions and are designed to show the succession of plant life on the earth.

Economic botany. On the first floor of the building are 24 cases of drugs in two series, crude drugs and refined drugs. The crude drugs are arranged morphologically, as from roots, stems, bark, flowers etc. to the whole plant. Refined drugs are first divided into products, and these arranged in their natural families. In this section is shown a collection of local poisonous plants; 20 cases of woods and wood products; 12 cases of fibers, 9 cases containing crude fibers and their products, 2 cases of wood paper and straw paper; one case of cork; 12 cases of foods and food plants divided into three groups; 1 case of dry seeds and fruits, 2 cases of fleshy seeds and fruits, 3 cases of herbs or parts of herbs or woody plants other than seeds or fruit.

A collection of miscellaneous exhibits fills 20 cases as follows: 1 of turpentine and rosin; 3 of gums and resins; 2 of fodder plants; 1 of crude and refined sugars; 1 of tobacco; 2 of volatile oils, 1 of fixed oils; 1 of starches; 1 of chocolate; 1 of barley malt, beer and ale; 1 of grape juice and wines; 1 of cinnamon; 1

of spices; 1 of licorice; 1 of soap-making, insect powders and miscellaneous vegetable products.

The specimens throughout the economic museum are supplemented by plates, photographs and drawings.

Systematic botany. A general synoptic collection consisting of 72 cases occupies the second floor of the building. Typical specimens of plants occupy the backs of the cases while on the shelves are arranged photographs, drawings, flowers, fruits, woods, fossils, etc. The present installation is as follows: one case (the first) contains the myxomycetes or slime molds. The seven cases following this are devoted to the algae or seaweeds. The succeeding seven cases contain the various groups of the fungi. Three cases are devoted to the lichens, two to the hepatics, four to the mosses, three to the pteridophytes, three to the gymnosperms, six to the monocotyledons and 36 to the dicotyledons.

There is also a collection mounted on swinging frames of every species of plant known to grow naturally within 100 miles of New York. A unique exhibit, both suggested and presented by William E. Dodge, consists of 24 microscopes of special design showing a series of slides of cryptogamic plants.

The library and herbarium occupy the third floor. There are 13,000 volumes now in the library, about one half of which constitute the botanic library of Columbia university.

The herbarium contains 1,100,000 specimens, 700,000 in the Columbia herbarium and 400,000 in the garden herbarium. The latter collection is rapidly gaining in value and importance.

1 Garden herbarium. The specimens composing it have been derived from collections made in all parts of the world during the past few years (specially since the foundation of the garden) in addition to miscellaneous specimens and many rare sets of plants of earlier collections fortunately acquired through the accessions of the following collections:

The J. B. Ellis herbarium, of fungi.

The John J. Crooke herbarium, mainly North American.

The F. M. Hexamer herbarium, European and North American.

The H. E. Hasse herbarium, North America, largely Californian.

The Per A. Rydberg herbarium, North American and European.

The Lewis R. Gibbes herbarium, North American, mainly from South Carolina.

The Peter V. LeRoy herbarium, miscellaneous.

The Harry Edwards herbarium, North American, mainly Californian.

The Anna M. Vail herbarium, eastern North America.

The Francis E. Lloyd herbarium, North American, largely from Oregon.

The A. Vignier herbarium, mainly European and Mexican.

The E. C. Howe herbarium, North American, largely fungi.

The American museum of natural history herbarium, miscellaneous.

The Torrey botanical club herbarium, vicinity of New York city.

The T. F. Allen herbarium of Characeae.

The George V. Nash herbarium, miscellaneous, mostly American.

The A. Henry herbarium of Chinese plants.

The Elizabeth G. Britton, herbarium, eastern North America.

The Gustav Rampsperger herbarium, miscellaneous.

2 Columbia herbarium. The Columbia university herbarium was begun early in the last century by Dr John Torrey, and contains the material upon which his botanical writings, extending over half a century, were based. On this foundation the present Columbia herbarium was built. Mr John J. Crooke enriched it by two valuable collections: one, that of Prof. C. J. Meisner, of Basle, Switzerland, and the other that of the late Dr A. W. Chapman, of Apalachicola Fla. A few years later the mosses, and many of the hepatics and lichens accumulated by C. F. Austin, were incorporated in it, while the most recent acquisitions of great size and importance, are the most famous collection of mosses brought together from all parts of the

world by the late Dr J. G. Jaeger, of Switzerland, and the Morong herbarium. To this ample nucleus, Dr Torrey's successor, Dr N. L. Britton, while professor at Columbia, and his associates, added continually by securing collections from all parts of the globe, and by special collecting trips to various parts of America.

The conservatories consist of a range of 15 houses with about one acre of floor space. The construction throughout is in accordance with the most modern principles and the structures form the most elegant glasshouses in the world. Over 20,000 plants, representing 6000 species are now growing in the houses. The collections are arranged botanically as far as temperature conditions will permit. There is also a system of propagating and experimental greenhouses.

The outside collections are in the Herbaceous ground, the Fruticetum and the Arboretum. About 2700 species of herbaceous plants and over 300 trees represent almost all orders of plants containing hardy species.

The wild flora has been carefully conserved and includes over 600 flowering plants and about 2000 cryptogams.

The museum is a new specially designed building of Italian renaissance style, of Indiana limestone and terra cotta. It is specially equipped with all modern appliances for the comfort of those using it and is open to the public daily from 9 a. m. to 5 p. m. The library and herbarium are open to students. There are no regular courses of instruction but properly prepared students are given such guidance and assistance as they may need to prosecute investigations. Two courses of public lectures are provided during the year.

OHIO

Cincinnati zoological garden, Cincinnati. S. A. Stephen, *general manager*; W. Kesley Schaepf, *president*; Walter A. Draper, *secretary*.

The garden is situated 3 miles from the center of the city in an easily accessible locality. The natural landscape features

have been taken advantage of in adapting the garden to its present use. The garden is open the year around to visitors, a small admission fee is charged. The animals are housed in a number of specially designed buildings. There is also a clubhouse and restaurant. The collections include the following specimens: mammals, 643; birds, 691; reptiles, 176; total, 1510.

The lake and small ponds are well stocked with fish. A small library of reference books is maintained.

PENNSYLVANIA

The Highland park zoological garden, Pittsburg. William W. Bailey, *superintendent*.

About 200 specimens of monkeys, Herbivora, Carnivora, birds and reptiles.

The Zoological society of Philadelphia, Philadelphia zoological garden. Charles Platt, *president of the board of directors*; Henry C. Chapman, *corresponding secretary*; A. E. Brown, *superintendent*.

The collections consist of animals of the higher orders of vertebrates. 1465 species have been exhibited belonging to the following orders: mammals, 407; birds, 711; reptiles 304; batrachians, 43.

The society maintains a library for reference.

RHODE ISLAND

Roger Williams park zoological garden, Providence. A small collection of animals is maintained by the city park commission, the collection at present consists of: mammals, 20 species, 90 specimens; birds, 14 species, 225 specimens; reptiles, 1 species, 4 specimens. There is also a small reference library and museum.

Among those which are not otherwise noted are the following:

Missouri botanical garden, St Louis Mo. William Trelease, *director*.

National botanical garden, Washington D. C. William R. Smith, *director*.

Harvard botanical garden, Cambridge Mass. (Collections partly enumerated under Harvard university). George L. Goodale, *director*.

Buffalo botanical garden, John R. Cowell, *director*.

The Arnold arboretum, Boston Mass. C. S. Sargent, *director*.

The city of Detroit is now building an aquarium and maintains a zoologic garden.

There is also a collection of animals in Lincoln park, Chicago.

ADDENDA

Received too late to be inserted in their proper place in the text.

CALIFORNIA

California academy of sciences, San Francisco. Leverett Mills Loomis, *director of the museum and curator of ornithology*; H. H. Behr, *curator of entomology*; Alice Eastwood, *curator of botany*; John Van Denburgh, *honorary curator of herpetology*; Alfred L. Kroeber, *honorary curator of anthropology*; F. M. Anderson, *honorary curator of paleontology*; Charles Fuebis, *preparator of entomology*.

Paleontology. Small collection chiefly of invertebrate fossils. It contains a number of type specimens and is constantly growing.

Mineralogy. Several thousand including many rare specimens.

Economic geology. Collection small.

Zoology. An extensive collection representing all orders. Birds about 20,000 including several types; 4500 reptiles and batrachians with a few type specimens; 4000 fishes, 36 types; 45,000 insects with over 1000 types.

Much material for exchange.

Botany. 110,000 specimens. Every department of botany is well represented. The collection is of general distribution but particularly rich in Pacific coast N. A. plants, and contains the types of many species.

Specimens for exchange.

Ethnology. 2200 specimens from Alaska, California, South Sea islands and Japan, specially strong in Polynesia. The academy has a library of 11,000 volumes on natural history and publishes a series of proceedings (octavo) memoirs (quarto) and occasional papers (octavo).

MICHIGAN

Detroit Museum of Art, Detroit. A. H. Griffith, *director*.

Paleontology. 5000 specimens.

Mineralogy. 3000 specimens.

Economic geology and lithology. 300 specimens.

Zoology. 8000 insects, 60,000 mollusks and 700 specimens of other orders.

Botany. A collection of 3000 specimens.

Ethnology. 3500 specimens.

PENNSYLVANIA

Lehigh university, South Bethlehem.

Paleontology. 3000 specimens illustrating common genera. Paleozoic Mollusca and Brachiopoda best represented.

Mineralogy. 10,000 specimens included in the Roepper collection, a general collection of 3000 specimens; the Keim collection of 1000 specimens and about 300 other specimens and a practice collection of 2500 specimens.

Economic geology and lithology. 4000 specimens: illustrative collections from the Rocky mountains; ores of precious metals, copper and iron ores and coal; specimens of rocks from all parts of the world but chiefly from Europe and the United States. 400 specimens for exchange.

Zoology. 2500 specimens. The Werner collection of North and South American birds, nests and eggs, 600 specimens; the Packer collection of recent shells, mostly gastropods, 1000 specimens, and a synoptic collection of 2500 specimens.

Botany. A small collection, mainly microscopic sections.

Ethnology. 1000 specimens North American Indian weapons, clothing and utensils.

CANADA

Museum of the geological survey of Newfoundland, St John's.
James P. Howley, *director*.

Paleontology. 1173 specimens divided as follows: Archaeozoan, 3 specimens of *Eozoon canadense*; Avalonian, *Arenicolites* and *Aspidella* from Newfoundland, *Oldhamia radiata* from Ireland. Cambrian; about 500; lower series well represented, many typical fossils from Newfoundland. Lower Silurian 200, Middle Silurian 150, Upper Silurian 40, some Devonian forms; Carboniferous 200. The above all from Canada and Newfoundland except as noted. Jurassic 25, England; Cretaceous 26, England and United States; Tertiary 32, Canada and United States.

Mineralogy. 500 specimens, chiefly from Newfoundland localities the remainder from various countries.

Economic geology. Specimens of granites, sandstones, marbles, serpentine, slates, clays, etc.

Lithology. A collection of rock specimens.

Zoology. 1659 specimens: 30 native and 12 Australian mammals. 150 native and 165 foreign birds; 50 native and 502 foreign fishes; 250 native and 500 foreign shells, a few native and many foreign insects.

Botany. 365 herbarium specimens; 28 native woods.

Ethnology and anthropology. Bones and other remains of the Beothucs, the Indians of Newfoundland. Stone and iron implements, ornaments, drawings, etc. A few Eskimo and Micmac implements, ornaments and utensils.

A good set of fishery products including oils, fertilizers, preserved fish, etc. Models of fishing vessels and implements; photographs illustrating the fisheries industry; numerous photographs of mining, lumbering and natural scenery. A number of local historical relics and many others from foreign sources.

A few specimens in all departments except ethnology for exchange.

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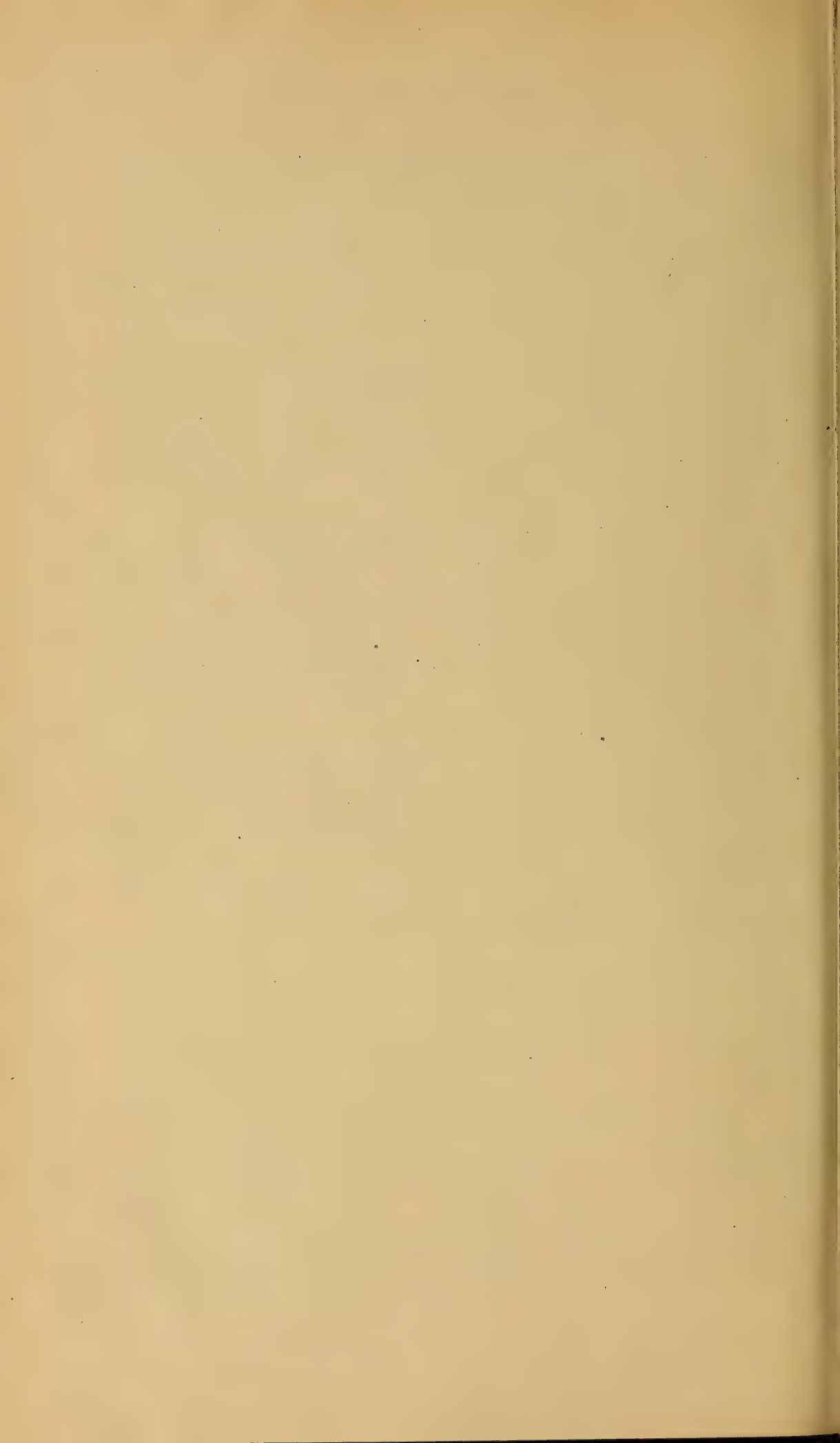
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New York State Museum

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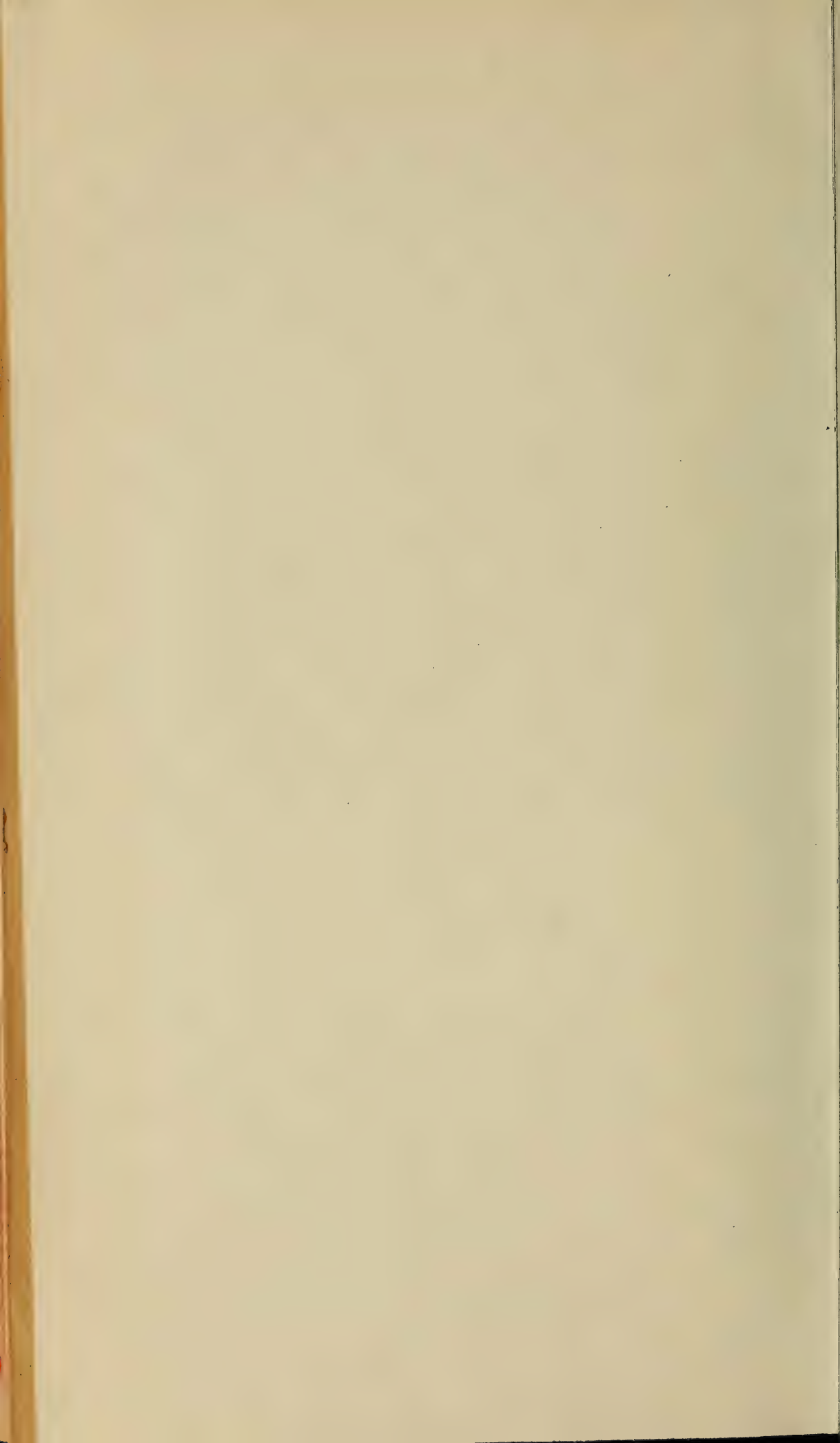
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